



**WYMAN-GORDON  
NORTH GRAFTON, MASSACHUSETTS  
WEST SIDE PCB REMEDIATION  
APPLICATION FOR APPROVAL OF  
RISK- BASED DISPOSAL**

PREPARED FOR:  
Wyman-Gordon  
North Grafton, Massachusetts

PREPARED BY:  
GZA GeoEnvironmental, Inc.  
Norwood, Massachusetts

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Re: Wyman-Gordon  
North Grafton, Massachusetts  
West Side PCB Remediation  
Application for Approval of Risk-based Disposal

Dear Ms. Tisa;

On behalf of Wyman-Gordon Company (W-G), GZA GeoEnvironmental, Inc. (GZA) has prepared this Application for Approval of Risk-Based Disposal for PCB remediation being conducted at the W-G North Grafton, Massachusetts facility. Remediation activities at this facility are being conducted in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.000); the Site is listed with Massachusetts Department of Environmental Protection (MassDEP) as Release Tracking Number (RTN) 2-00535. As an MCP Tier 1A Site, all Site investigation, mitigation and remediation activities and outcomes are subject to review and approval by MassDEP.

The W-G facility is a large industrial forging operation. The subject portion of the West Side of the W-G facility is undeveloped and was historically used for soil borrow, and subsequently for disposal of various materials including construction debris, industrial debris from the facility operations, and waste materials generated by forging operations. Disposal of such refuse and waste materials in the vicinity of the proposed West Side PCB remediation areas ceased ca. 1974. The proposed remediation includes excavation and off-site disposal of upland soil and wetland soil from a portion of the West Side of the North Grafton facility referred to as the "West PCB Area". The proposed remediation activities will reduce PCB concentrations so that they are below human health and ecological risk based clean-up goals developed via Site-specific risk assessments.

The following document presents the PCB data for the W-G West Side, discusses the development of risk-based clean-up goals, and presents the proposed remediation program. The certification required by 40 CFR 761.61(a)(3)(E) is provided in Appendix E.

Thank you very much for your attention to this project. Please call the undersigned at 781-278-3700 with any questions.

Sincerely,  
GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read "Timothy L. Briggs".  
Timothy L. Briggs  
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A handwritten signature in blue ink, appearing to read "Gregg McBride".  
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Principal

A handwritten signature in blue ink, appearing to read "Michele Simoneaux".  
Michele Simoneaux  
Project Reviewer

cc: Brian Postale, W-G  
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## 1.00 INTRODUCTION



This report presents supporting documentation for an Application for Approval of Risk Based Disposal (Application) under the federal Toxic Substances Control Act (TSCA) (40 CFR 761.61 [c]) for polychlorinated biphenyls (PCBs) in upland soil and wetland soil on the West Side of the Wyman-Gordon (W-G) facility in North Grafton Massachusetts (a portion of which extends over the town line into Millbury Massachusetts).

The area subject to this Application is approximately 4.0 acres of a 200 acre Site which is listed with Massachusetts Department of Environmental Protection (MassDEP) as Release Tracking Number (RTN) 2-00535. Remediation activities at this Site are being conducted in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.000) under the conditions of Tier 1A Permit Number 84800. As an MCP Tier 1A Site, all Site investigation, mitigation and remediation activities and outcomes are subject to review and approval by MassDEP.

A Phase IV Remedy Implementation Plan (RIP) which detailed the proposed remedial activities for the portion of the West Side was submitted to MassDEP on January 20, 2010 and MassDEP issued a conditional approval letter on April 12, 2010. The approval was for proposed Response Actions for MCP-regulated contaminants, including PCBs. A low permeability cap has been approved to cover previously buried waste materials. In addition, W-G is proposing to reduce PCB concentrations within a portion of the West Side referred to as the “West PCB Area”<sup>1</sup>, in order to eliminate current risks to human trespassers within the entire West Side, and mitigate risk to ecological receptors within the West PCB Area. This Application proposes to accomplish these goals by using a combination of excavation of wetland and upland soils, and capping. The remainder of the West Side is being managed under the MCP and is not the subject of this Application.

Remedial activities proposed within the West PCB Area are:

1. Wetland Soil: Excavate locations characterized by surface wetland soil samples that exceed the risk-based human health and ecological clean-up goals (9.5 milligrams per kilogram (mg/kg)). This will be accomplished by excavation of approximately 5,846 sq. ft. of wetland soil in the West PCB Area.
2. Upland Soil – Excavate for off-Site disposal upland soil locations with soil characterized by samples with PCBs >100 mg/kg, and consolidation of soils >25 mg/kg and ≤100 mg/kg under the low permeability cap. These activities will eliminate current health risks to trespassers and reduce exposure potential in surficial upland of the West PCB Area such that the remaining concentration of PCB in surficial soil of the West PCB Area will meet the ecological clean-up goal for soil of 1.22 mg/kg. The low permeability soil cap will meet the TSCA requirements and additionally serve to cover and isolate other MCP-regulated contaminants.
3. Place a TSCA deed restriction on the area of the cap, as required by the TSCA regulations to provide an institutional control over the area so that a condition of No

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<sup>1</sup> A description of the West PCB Area is presented below in Section 1.10. The West PCB upland soil area, as shown on Figure 3, has been defined based on the source of the PCBs, the distribution of PCB concentrations in soil, and landmark features including the existing cart path and the Power Line Wetland.

Significant Risk (NSR), as defined by the MCP, will be maintained. Additional restrictions, in the form of Activity and Use Limitations (AULs), will eventually be placed on the larger Site.



This document provides a background discussion of the history and investigation of the West Side area. It also presents chemical data collected for PCBs within West Side area, presents risk-based clean-up calculations for human and ecological receptors, and presents the proposed excavation and restoration program intended to reduce PCB concentrations within the West PCB Area to meet the proposed risk-based clean-up goals. An alternatives analysis is also presented; this analysis looks at the extent of remediation and costs that would be associated with removing soils represented by samples with PCB concentrations greater than or equal to 1 mg/kg.

This Report is subject to the Limitations contained in Appendix A.

### 1.10 BACKGROUND

The W-G plant is located at 244 Worcester Street (Route 122) in North Grafton, Massachusetts (Figure 1). The southwest corner of the W-G property included several buildings in Millbury, Massachusetts (1529 Grafton Road); some of these buildings have recently been sold so that W-G now owns just one building in Millbury. A large tract of W-G property behind (i.e., north of) the Millbury buildings is undeveloped. Electrical power lines run along the boundary between the towns of Grafton and Millbury on property owned by National Grid, which bisects the W-G property.

Prior to 1943, the North Grafton property was used for community farming. The site was acquired by the United States Reconstruction Finance Corporation and was subsequently sold to the United States Air Force. Industrial operations have been performed at the North Grafton plant since approximately 1945, at which time the original North Grafton forge shop was constructed. Since 1945, the facility was increased in size approximately four times, with the construction of new buildings and the addition of new manufacturing processes. W-G purchased the facility from the United States Air Force in June 1982.

From the 1940s through the 1970s the undeveloped property north of the Millbury buildings was used to mine soil (some of which was used to construct the Massachusetts Turnpike), and as a disposal area for various solid wastes. Based on information accumulated by W-G and presented in a 1985 report to the U.S. Environmental Protection Agency (W-G, 1985) several areas of potential concern were identified in the western portion of the property<sup>2</sup>. Wastes disposed in this area are dominated by land filling with construction debris, and piles of asphalt. Mixed with this landfill material was industrial and laboratory refuse from W-G research and development, as well as forge operation by-products. Disposal practices for manufacturing by-products included disposal pits, which have been designated areas of concern W5, W11 and W12. Area of concern W10 is an area of soil and asphalt debris piles (Figure 2) which overlaps areas W5 and W11. Materials disposed in the W5, W11 and W12 pits included acid waste neutralization sludge (W5), descaling salt cake/salt sludge (W11) and aluminum dross (W12). Disposal pits at

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<sup>2</sup> The self disclosure of possible disposal areas and processes on the entire W-G property was a response to USEPA regarding RCRA Corrective Action. The areas of concern on the West Side are designated by the prefix "W".

W12 were closed in 1967, and disposal pits at W11 were closed in 1972 and 1974 (Wyman-Gordon, 1985). Activities at W5 were initiated in 1979, however, there is no record as to when activities at W5 ended (Wyman-Gordon, 1985)



## 1.20 RESPONSE ACTIONS UNDER THE MCP

The MCP Phase II Comprehensive Site Assessment (CSA) for the entire West Side was initiated in 2001. During the course of the Phase II field work, a debris pile was observed to the west of the W5, W11 and W12 areas of concern. The eastern portion of this debris pile, adjacent to an existing wetland, included several empty and crushed barrels visible at the surface, other refuse, and black fill material. The laboratory analyses for samples from this fill material and soil from the adjacent wetland detected metals, petroleum and PCBs<sup>3</sup>. Subsequent sampling in the area near the eastern edge of the fill revealed concentrations of Aroclor 1254 as high as 1832 mg/kg in wetland soil, and as high as 4400 mg/kg in the upland soil/fill material. In addition, several soil samples with PCB concentrations over 100 mg/kg were detected to the west of this fill material, between the fill and an access cart path. Based on the levels of PCBs associated with this area, it has been designated the “West PCB Area” (see Figure 2). Areas of concern W5, W11 and W12 are within the area designated as the West PCB Area.

In August 2004, MassDEP requested that an Imminent Hazard (IH) Evaluation be conducted for the West PCB Area. This request was in response to the detection of PCB concentrations in surficial soil samples higher than 10 mg/kg (which is the potential IH concentration listed in the MCP), and the knowledge that trespassers were occasionally observed on the property. A total PCB concentration of 4,400 mg/kg was detected in sample GSS-105, and a total PCB concentration 2,250 mg/kg was detected in sample GSS-108. GZA prepared an IH Evaluation (GZA, 2004) which concluded that Imminent Hazards to human health, safety, and the environment did not exist in the West PCB Area<sup>4</sup>. A focused Human Health Risk Assessment under the Resource Conservation and Recovery Act (RCRA) was performed in 2005 which also found that there was no significant risk to humans under current conditions. That risk assessment is discussed further below.

The MCP Phase II CSA for the West Side, which included human health and ecological risk characterizations, was completed in April 2007 (GZA, 2007). Under current conditions significant risks to human health are present on the West Side due to exposure of trespassers to soil outside the facility fence. Exposure to PCBs is the main driver behind the risks calculated for trespassers. The selected Remedial Action Alternative (RAA) for the West Side involves excavation and off-Site disposal or capping of soil with PCB concentrations above risk-based goals. This will reduce the cumulative human health risk under current conditions to below MassDEP allowable risk limits, and make this area eligible for a Partial Class C

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<sup>3</sup> Note that laboratory analyses reported in the MCP Phase II and Phase III included PCB analyses via standard SW 846 Method 8082/3541. As discussed below, sampling performed in November 2011 utilized the preferred manual Soxhlet extraction (Method 8082/3540C). Confirmatory sampling to be performed as part of the proposed remediation efforts will also be done using manual Soxhlet extractions.

<sup>4</sup> IH Assessments are risk characterizations which focus on hazards due to current exposures over a short period of time. A Method 3 Risk Characterization evaluates human health risks for both current and future exposures over different time periods, depending on Site-specific conditions. The two types of assessments are also different in that the calculated risks are compared to different significant risk benchmarks, with the IH benchmarks generally being higher.



Response Action Outcome (RAO). A TSCA deed restriction will be placed on the area to provide institutional control to eliminate future exposures to residual PCBs under the cap.

Potential risks to ecological receptors are due to several contaminants of concern (COCs), including PCBs, in upland soil, wetland soil, and surface water. The excavation of wetland soil to eliminate current risks to human trespassers will also reduce PCB concentrations sufficiently to eliminate PCB risks to ecological receptors in wetland areas. Excavation and capping of upland soil to eliminate risks to human trespassers will also eliminate potentially significant PCB risks to ecological receptors in upland soil in the West PCB Area.

A Phase IV Remedy Implementation Plan (RIP) which detailed the proposed remedial activities to achieve a Temporary Solution under the MCP for the West Side outside of the North Grafton facility fence was submitted to MassDEP on January 20, 2010 and MassDEP issued a conditional approval letter on April 12, 2010<sup>5</sup>. As documented in Phase III Remedial Action Plan for the West Side (GZA, 2007, and summarized below) and the Phase III Addendum report (GZA 2008), the remedial cost-benefit analyses indicated that it is not feasible to clean-up the entire West Side to eliminate current and foreseeable future risks to human health and the environment. Remediation to eliminate all current and future risks would require widespread excavation and capping and/or off-Site disposal. The monetary cost and destructive physical impacts to wetland and upland habitat areas would not be justified by the incremental benefits compared to more targeted remediation to eliminate the exposures with the highest estimated risk.

### 1.30 U.S. EPA RCRA CORRECTIVE ACTION PROGRAM

The W-G North Grafton facility is in the RCRA Corrective Action Program due to its previous temporary status as a Storage Facility of Hazardous Waste. The remedial effort completed to date has been focused on the areas of concern identified under that program. In 2005, at the request of MassDEP and USEPA, GZA prepared a focused risk assessment for the West Side of the W-G North Grafton facility in order to address the Current Human Exposures Under Control Environmental Indicator (EI) as defined by the RCRA Corrective Action program. The human exposure pathways defined by the EI focused on likely current exposures; MassDEP and USEPA agreed that the current exposures occur primarily due to travel by trespassers on carpaths. Based on the focused Method 3 Risk Characterization prepared in accordance with MCP procedures, the cumulative non-cancer and cancer risk estimates for current trespassers did not exceed MCP risk limits. Therefore, it was concluded that current exposures to soil, wetland soil, and surface water on the West Side do not represent a significant risk to current receptors.

## **2.00 NATURE AND EXTENT OF PCBs ON THE WEST SIDE**

Investigations in the subject West PCB Area have been conducted over a number of years as part of MCP Response Actions. PCB analyses were performed using EPA Method 8082 (results reported as Aroclors). PCBs have been reported as either Aroclor 1254 or 1260; most of the highest concentrations were reported as Aroclor 1254. For this reason, “total

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<sup>5</sup> One of those conditions was the addition of a low permeability cap over the W5, W11 and W10 areas of concern.

PCBs” discussed in this report, and presented on the tables are the sum of the Aroclor 1254 and 1260 concentrations; for samples for which one or both of these Aroclors was reported as not detected, one-half the method detection limit was used as an estimate for that Aroclor in that sample.



Most of the PCB data for the West Side were collected during the MCP Phase II CSA, for which PCB analyses were performed using the standard SW 846 Method 8082/3541. A supplemental PCB investigation was performed in the West PCB Area during October and November, 2011 to further better define the distribution of PCBs in the proposed excavation areas. Soil samples collected during the 2011 effort were analyzed using EPA Method 8082/3540C (with manual Soxhlet extractions).

The following sections discuss PCB concentrations detected in upland and wetland soil of the West PCB Area, soil, and particulate-related PCBs detected in three groundwater samples from small diameter, driven wells (piezometers).

## 2.10 SOIL

Soil samples have been collected in one of four ways: from a split spoon during soil borings for monitoring well installation, from plastic core liners advanced using GeoProbe equipment, from an excavator bucket during test pit excavation, or from hand augers for shallow explorations. In all cases, the sample was extracted from the sampling equipment, placed in a stainless steel bowl, homogenized with a stainless steel spoon, and then transferred to the appropriate sampling containers for submittal to the analytical laboratory. Samples were placed in a cooler on ice for transport to the analytical laboratory. In between sample locations, sampling equipment was decontaminated by washing in an Alconox solution, rinsed with tap water, and a final rinse with deionized water.

The supplemental investigation performed in November 2011 included 38 borings which were advanced with a Geoprobe to depths of 7-10 ft below ground surface (BGS), and arranged on a 50 ft grid. Samples were collected from each boring at 6 different depth intervals (0'-1', 1'-2', 2'-4', 4'-6', 6'-8', and 8'-10'). Selected samples intervals were analyzed for PCBs via SW Method 8082/3540C. The results of these analyses, combined with results from the previous investigations described above, were used to define the extent of PCBs in the proposed excavation areas.

Table 1 presents PCB analytical data for upland soil samples for the West PCB Area. Laboratory reports for soil samples analyzed for PCBs are presented in Appendix B.

Figure 3 presents sample locations for the West PCB Area and vicinity. Figure 3 is color coded according to various ranges of total PCBs detected. The main area of concern with respect to PCBs in the West Side is the West PCB Area (in the vicinity of Areas of Concern W5, W11 and W12), where high concentrations of PCBs have been detected within, and near a debris pile and oily fill at the edge of a wetland. Eighteen soil samples collected from the West PCB Area contained total PCB concentrations above 100 mg/kg; ranging from 114 mg/kg to 4,400 mg/kg. PCB concentrations in upland soil of the West PCB Area are, for the most part, either greater than 100 mg/kg, or less than 50 mg/kg (only three samples had concentrations between 50 mg/kg and 100 mg/kg). Only eight samples had PCB concentrations between 25 mg/kg and 50 mg/kg.





As stated, the proposed remediation strategy is to excavate and dispose off-Site soils with PCBs >100 mg/kg, and consolidated under a cap soils with PCB >25 mg/kg and ≤100 mg/kg. As discussed below, given the apparent distribution of PCB concentrations (i.e., few samples with concentrations between 50 and 100 mg/kg) we will also attempt to dispose of soils with PCB concentrations >50 mg/kg and ≤ 100 mg/kg off-Site. However, if, during sampling for the remedial effort, we find that this would significantly increase the volume of soil to be disposed off-Site, these soils will also be consolidated under the cap.

An alternatives analysis is presented below which indicates that the remediation effort to remove soil with PCB concentrations greater than or equal to 1 mg/kg is not warranted (TSCA defines soil and sediment with PCB concentrations less than 1 mg/kg to be “clean”, as per 40 CFR 761.125(b)(1)(ii), and (c)(4)(v)).

## 2.20 WETLAND SOIL AND SEDIMENT

Table 2 presents PCB data for wetland soil and sediment samples. Laboratory reports for samples analyzed for PCBs are presented in Appendix B.

The Power Line Wetland is an artificial basin (or series of basins) formed by filling to create cart paths and the railroad bed to the north. There are, essentially, no defined channels within the Power line Wetland (aside from short sections at the mouths of culverts that drain the wetland), therefore, all samples collected from the Power line Wetland are wetland soil, as defined by the MCP at 310 CMR 40.0006(12), rather than sediment samples.

The wetland portion of the West PCB Area, adjacent to the oily fill material, is the wetland area of concern with regard to PCBs. Seven wetland soil samples collected within approximately 30 feet of the toe of the fill slope contained total PCB concentrations greater than 100 mg/kg (detected concentrations in those seven samples ranged from 145 to 1832 mg/kg). Further eastward, away from the toe of the fill slope, the PCB concentrations drop abruptly. None of the PCB concentrations detected further than 30 feet from the slope were above 50 mg/kg, only one sample was between 25 and 50 mg/kg (47.5 mg/kg in SED-229C), and only three samples contained PCBs above 10 mg/kg.

The proposed wetland soil remediation area will extend approximately 105 feet eastward from the toe of the fill slope, and will encompass wetland soil samples with total PCB concentrations above the 9.5 mg/kg clean-up goal. Concentrations within the Power line Wetland outside of the remediation area are quite low, with only three of 17 samples having PCB concentrations above 1 mg/kg (those samples are SED17B, -31C and -29C with concentrations of 1.35, 1.84 and 4.7 mg/kg, respectively).

## 2.30 GROUNDWATER

PCBs were analyzed in 19 groundwater samples between December 26, 2000 and March 23, 2003 (Table 3). PCBs were detected in three of these samples collected from small diameter wells (piezometers); samples from PZ-1, -2 and -5 collected on April 4, 2001 were collected as “total” PCB samples (i.e., no filtering, and did not use low-flow techniques), and total PCB values reported ranged from 0.45 to 3.7 µg/l. These small diameter wells were re-



sampled as filtered samples<sup>6</sup> on May 16, 2001, and all analyses resulted in non-detects at method detection limit of 0.2 µg/l. These results indicated that the PCBs detected in groundwater samples on April 4, 2001 were associated with larger particulates in the samples, and were not present as dissolved PCBs, nor PCBs associated with colloidal particulates that may be mobile with groundwater.

PCBs in groundwater are not a concern for the W-G West Side.

### **3.00 REMEDIAL ALTERNATIVES EVALUATION**

GZA submitted a Phase III Remedial Action Plan (RAP) Report to MassDEP on November 6, 2007, which included RAAs to address risks to human health and the environment from all COCs at the site. For reasons summarized below, the preferred RAA, and the one presented in this Request for Risk-based Clean up, is to perform limited excavation with off-site disposal in order to eliminate significant risk to human health and the environment posed by PCBs. Also presented below is an RAA that would eliminate PCB concentrations of 1 mg/kg or greater, however, this RAA was not proposed because of the high cost relative to the small incremental gain in risk reduction.

#### **3.10 MCP PHASE III REMEDIAL ACTION PLAN**

The MCP Phase III RAP documented the identification, evaluation and selection of three RAAs for the entire West Side of the Wyman-Gordon Facility. MassDEP provided comments on the Phase III report in a letter dated January 18, 2008 and titled "Request for Revised Phase III Remedial Action Plan". A Phase III RAP Addendum was submitted to MassDEP on March 14, 2008, and MassDEP issued a conditional approval in a letter dated June 17, 2009.

The remedial alternatives evaluated for the West Side<sup>7</sup> (including any amendments incorporated in the Phase III RAP Addendum) are summarized as follows:

RAA 1: Horizontal Engineered Barrier: This RAA would achieve a Permanent Solution under the MCP. This RAA would involve constructing an engineered barrier to cap contaminated upland soil over an area of approximately 10 acres. This alternative would also include excavation of approximately 5 acres of wetland soil and sediment, which would then be consolidated under the cap.

RAA 2: Limited Excavation with Off-Site Disposal: This RAA would eliminate Substantial Hazards (defined at 310 CMR 40.0956) due to current risks to public welfare due to exceedances of the MCP Upper Concentration Limit (UCL) for PCBs at the West PCB Area, and current risk to human health (trespassers) due to PCBs in the West PCB Area. This alternative would achieve a Temporary Solution under the MCP. This RAA

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<sup>6</sup> These small diameter wells did not produce sufficient flow of water to be sampled using low-flow techniques.

<sup>7</sup> The West Side of the Wyman-Gordon facility is approximately 55 acres, and encompasses several areas of concern. The summaries presented here include only those aspects of the RAAs that pertain to the West PCB Area.

would involve excavation and off-Site disposal of PCB impacted upland and wetland soil at the West PCB Area, and removal of exposed metal debris and slope stabilization in the West PCB Area and other areas of the Site.



RAA 3: Excavation with Off-Site Disposal: This RAA would achieve a Permanent Solution under the MCP. This RAA would involve excavation of upland soil over approximately 10 acres (including the West PCB Area) and wetland soil and sediment over about 5 acres, with off-Site disposal.

As outlined above, in order to eliminate risk to humans and the environment under current and future conditions, capping and/or excavation of approximately 10 acres of upland soil (including the West PCB Area) and approximately 5 acres of wetland soil and sediment would be required. The extent of the remediation required to achieve a Permanent Solution is governed by future risks to humans and risks to ecological receptors due to exposure to, primarily, metals. RAA 1 and RAA 3 would cause disruption to large areas of upland, wetland and aquatic habitat areas which currently provide viable habitat to ecological receptors, notwithstanding the fact that we could not find a “condition of No Significant Risk”. Furthermore, work in and around the wetland areas, or on slopes at preferential storm water flow paths has the potential to cause erosion and sedimentation, which could spread contamination to areas that are currently not impacted. The estimated costs to perform RAA 1 and RAA 3 are \$6.9 million and \$17.3 million, respectively.

The Phase III concluded that the monetary cost and destructive physical impacts to wetland and upland habitat areas would not be justified by the incremental benefits compared to more targeted remediation to eliminate the exposures with the highest estimated risk. Therefore, RAA2 – Limited Excavation with Off-Site Disposal was chosen as the recommended remedial action alternative for the West Side of the W-G Site.

Implementation of RAA2, as initially proposed, would eliminate current risks to trespassers and ecological receptors by excavation and removal of upland soil with PCB concentrations greater than 50 mg/kg, and wetland soil greater than 9.5 mg/kg. Groundwater monitoring was proposed to provide on-going observation of areas W5, W11, and W12, but the MassDEP’s Conditional Approval of the Phase IV required that a low permeability cap be placed over the waste disposal pits at areas of concern W5, W11, and W12. With the inclusion of that cap in the remedial design, the RAA2 design for PCB remediation was amended such that wetland and upland soils with PCB concentrations greater than 25 mg/kg, and up to 100 mg/kg would be consolidated under the cap rather than disposed off-Site. This was done to eliminate the need for a fence to isolate residual soils with PCB concentrations greater than 25 mg/kg.

Note that the volume of soil that is anticipated to be consolidated under the cap is relatively small, because most PCB concentrations in this area are either less than 25 mg/kg, or above 100 mg/kg. Only 11 of the 113 soil samples collected from this area contained PCB concentrations >25 mg/kg and ≤100 mg/kg, and only 3 samples contained PCB concentrations >50 mg/kg and ≤100 mg/kg.



### 3.20 REMEDIATION OF PCB TO LESS THAN 1 MG/KG



The additional area of excavation required to consolidate soils represented by samples within the West PCB Area with  $\geq 1$  mg/kg of PCBs under the cap would be approximately 77,000 sq.ft. in the upland, and approximately 9,250 sq.ft. in the wetland (Figure 3). Assuming one-foot of excavation in this additional upland area, and 2.5 feet of excavation in the additional wetland area, an additional 3,350 tons (or 2,300 cu.yds.) would need to be excavated and consolidated under the cap. This represents an increased in excavation effort of about 75 percent compared to the proposed remediation goals, and nearly a ten-fold increase in the volume of soil proposed to be contained beneath the cap.

From a monetary perspective, the proposed remediation strategy has been estimated at a cost of \$1.9 million, whereas excavation of all materials with PCBs  $\geq 1$  mg/kg would cost on the order of \$2.5 million. This additional \$600,000 represents an increase of about 32 percent compared to the cost of the proposed remediation.

The proposed RAA 2 - Limited Excavation with Off-Site Disposal (and amended to allow some consolidation under the cap) would reduce risks to levels below MCP limits, thus most of the risk posed by PCBs would be eliminated. The additional remediation work to achieve PCB levels below 1 mg/kg would provide relatively little additional benefit in terms of reduced risks due to PCBs. The additional monetary cost and destructive physical impacts to wetland and upland habitat areas required to remediate to  $< 1$  mg/kg PCBs would not be justified by the incremental benefits compared to more targeted remediation to eliminate the exposures with the highest estimated risk.

## **4.00 RISK-BASED CLEAN-UP GOALS FOR PCBs**

Risk-based clean-up goals for human health and environmental receptors were calculated as discussed in the following sections.

### 4.10 HUMAN HEALTH RISK CLEAN-UP CALCULATIONS

Trespassers, assumed to be contacting soil and sediment, was the human receptor group for which current conditions result in a potentially significant risk<sup>8</sup> within the portion of the West Side outside of the North Grafton facility fence, which includes the West PCB Area. The primary risk driver for the trespasser receptor group was PCBs. The goal of the proposed remediation program is to sufficiently reduce PCB concentrations in upland and wetland soil so that cumulative risks to trespassers (i.e., from PCBs and other site contaminants) no longer exceed MassDEP risk limits.

PCB risk-based clean-up goals were calculated to achieve a target non-cancer Hazard Index (HI) of 0.2 (versus the MassDEP risk limit of 1.0), and an Excess Lifetime Cancer Risk (ELCR) of one in one million ( $1 \times 10^{-6}$ ; versus the MassDEP risk limit of  $1 \times 10^{-5}$ ).

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<sup>8</sup> Note that the default exposure assumptions used for an MCP Method 3 Risk Characterization are more conservative than the focused, likely current exposures evaluated for a RCRA EI assessment. This accounts for the discrepancy between the No Significant Risk result from the EI risk assessment, and the finding of Significant Risk from the MCP Method 3.



These larger than necessary reductions in the calculated PCB risks compensate for additive risks contributed by other Site COCs<sup>9</sup>, so that the post-remediation cumulative risks to trespassers from all of the COCs will be below the MassDEP risk limits of an HI of 1.0 and an ELCR of  $1 \times 10^{-5}$ . The same exposure assumptions used in the Phase II risk characterization were used in the calculation of these remediation goals and are presented below.

Equations used to calculate risk-based concentration limits, and exposure assumptions for trespassers are presented in Table 4.

#### 4.20 ECOLOGICAL RISK CLEAN-UP CALCULATIONS

The food web assessment presented in the Phase II was used to back-calculate target remediation goals for upland soil and wetland soil. Wildlife indicator species used to evaluate the potential for risk due to exposure to upland soil contaminants were the American robin and short-tailed shrew. Wildlife indicator species used to evaluate potential risks due to contaminants in wetland soil were the marsh wren and short-tailed shrew. Table 5 presents the formula used to calculate risk-based clean-up goals, and the food web input parameters used for each receptor. The risk-based concentration limits are intended to protect the American robin (upland soil exposure), marsh wren (wetland soil exposure) and short-tailed shrew (for both upland soil and wetland soil exposures).

#### 4.30 SELECTION OF RISK BASED CLEAN UP GOALS

Table 6 presents the Risk Based Clean-up Levels (RBCLs) for upland soil and wetland soil calculated for humans and ecological receptors. RBCLs for PCBs in upland soil and wetland soil were selected as the lowest risk based concentration limit calculated among the human and ecological receptors.

For upland soils the RBCLs ranged from a low of 1.22 mg/kg for northern short-tailed shrew, to a high of 64 mg/kg total PCBs for cancer risks to human trespassers. The non-cancer risk limit for human receptors was 55 mg/kg. The lowest risk limit of 1.22 mg/kg was chosen as the target risk-based clean-up goal for PCBs within the upland soil of the West PCB Area.

For wetland soil and sediment the RBCLs ranged from a low of 9.5 mg/kg total PCBs for non-cancer risks to humans, to a high of 43.8 mg/kg for marsh wrens. The lowest concentration of 9.5 mg/kg was chosen as the target risk-based clean-up goal for PCBs within wetland soil and sediment.

### **5.00 PROPOSED RISK-BASED PCB CLEANUP**

Wetland and upland soils with PCB concentrations greater than 100 mg/kg will be excavated and properly disposed off-site. Upland soils with PCB concentrations >25

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<sup>9</sup> Aside from PCBs, COCs included tetrachloroethene, toluene, naphthalene, extractable petroleum hydrocarbon fractions, and several metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc).



mg/kg and  $\leq 100$  mg/kg, and wetland soil with PCB concentrations  $>9.5$  mg/kg and  $\leq 100$  mg/kg will be consolidated under a low permeability cap. As shown on Table 4, the RBCLs for human trespassers are 55 mg/kg for upland soil and 9.5 mg/kg for wetland soil. The proposed remediation program will mitigate current risks to humans by removing from the Site, or making inaccessible PCB concentrations above the human RBCLs. For ecological receptors the RBCLs are 1.22 mg/kg for upland soil and 11 mg/kg for wetland soil. PCB risks to ecological receptors in the Power Line Wetlands will be eliminated by excavation of wetland soils with concentrations above the RBCL of 11 mg/kg. Risks to ecological receptors due to PCBs in upland soil of the West PCB Area will be mitigated by reducing the average surficial soil PCB concentrations to less than the RBCL of 1.22 mg/kg, either by removal or consolidation under a cap.

As discussed, only a few of the wetland or upland samples from this area had PCB concentrations between 50 mg/kg and 100 mg/kg. Therefore, it is anticipated that the volume of soil with PCB levels in this concentration range will be relatively small. Therefore, a secondary goal of the proposed remediation program will be to remove soils with PCB concentrations  $>50$  mg/kg and  $\leq 100$  mg/kg from the Site rather than consolidating them under the cap. In the event of future removal actions, this would avoid having to dispose of any additional soils as Hazardous Waste under RCRA due to PCB concentrations greater than 50 mg/kg. However, if during the course of the remediation the volume of soil with PCBs between 50 mg/kg and 100 mg/kg is larger than anticipated, these soils will be consolidated under the cap, but in separate cells from soils with lower PCB concentrations.

The proposed remediation work in the West PCB Area will result in temporary alterations of wetland resource areas or earthwork within the 100-foot Buffer Zone to wetlands. Therefore, the proposed remediation work required several wetland-related permits under local, state and federal programs. In addition, a Phase IV Plan (RIP) report detailing the remediation program was submitted to MassDEP on January 20, 2010. Limited dewatering activities are anticipated for work in the wetland portion of the West PCB Area. GZA will likely obtain a NPDES Remedial General Permit (RGP) authorization for the anticipated discharges.

The earthwork will disturb greater than one-acre of land adjacent to the Power Line Wetlands. Wyman-Gordon will obtain a NPDES Construction General Permit prior to construction.

The following sections present summaries of the proposed remediation activities in the West PCB Area wetland and West PCB Area upland. Please refer to the following permit applications, supporting documents and permits for details regarding engineering, earthwork and environmental best management practices for the proposed remedial activities:

1. MassDEP Wetland File No. 164-729: Notice of Intent (for West PCB Area, Massachusetts Wetlands Protection Act and Town of Grafton Wetland By-law), Submitted to Town of Grafton Conservation Commission, October 10, 2008. Prepared by BSC Group, Inc. Orders of Conditions issued November 5, 2008; Town of Grafton Wetland Permit issued November 5, 2008, Permit No.569.



2. MassDEP Wetland File No. 224-636: Notice of Intent (for Small West Pond Area), Submitted to Town of Millbury Conservation Commission, September 5, 2008. Prepared by BSC Group, Inc. Orders of Conditions issued on October 8, 2008.
3. ACOE Application No. NAE-2008-02398: Wyman-Gordon Company, North Grafton, Massachusetts, MCP Remediation Projects in North Grafton and Millbury, Massachusetts, 404 PGP Category 2. Category 2 approval issued by Army Corps of Engineers July 20, 2009.
4. MassDEP 401 WQC Transmittal No. X007193: 401 Water Quality Certification, MCP Remediation Projects in North Grafton and Millbury, Massachusetts. Water Quality Certification issued February 19, 2009.
5. Phase IV Remedial Implementation Plan (RIP), Wyman-Gordon Facility West Side, MassDEP Release Tracking No. 2-0535, submitted to MassDEP January 21, 2010.

#### 5.10 WEST PCB AREA WETLAND

The lowest RBCL for human and ecological receptors exposed to PCBs in wetland soil and sediment was determined to be 9.5 mg/kg. An area of approximately 5,846 sq.ft. of wetland soil (Figure 3) will be excavated to remove sample locations that had total PCB results greater than 9.5 mg/kg. Following excavation, the wetland area will be restored as a wetland.

Soils within the Power Line Wetland are best characterized as peat, with peaty muck at depths starting at 20 to 27 inches below the surface. Total thickness of organic soil is on the order of 29 to 30 inches. Based on observations made during wetland soil sampling activities, the subsoil beneath the wetland peat appears to be well consolidated sandy clay loam, starting about 2.5 to 3 feet below the surface of the wetland peat. Based on analytical data for a sample of this subsoil<sup>10</sup>, concentrations that pose a significant risk to human and ecological receptors are limited to the surficial peat and peaty muck. GZA anticipates that within the 5,846 sq.ft. excavation footprint, the organic soil will be removed down to the sandy clay loam sub-soil (Approximately 2.5 to 3 feet below the surface), and then a confirmatory sampling program will be implemented as outlined in Appendix C.

The excavated wetland area will be backfilled with silty backfill material, and then at least one foot of high organic, manufactured topsoil to bring the final grade back to the original grade. The area will then be planted with common cattail (*Typha latifolia*) to re-establish the existing cattail marsh.

#### 5.20 WEST PCB AREA UPLAND

Figures 3 and 4 present the proposed extent of excavation and capping needed to remove or cap soils exhibiting total PCB concentrations of greater than 25mg/kg or higher within the West PCB Area. Upland soils with total PCBs in excess of 50 mg/kg were generally confined to the upper foot of soil except in two places: Excavation Areas A and C on

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<sup>10</sup> Sample SED-306 represented the top 6 inches of the sandy clay loam sub-soil. The total PCB concentration in SED-306 was 3.2 mg/kg, compared to concentrations averaging about 581 mg/kg in the surficial peat and peaty muck in this area.



Figure 3. In Excavation Area C total PCBs exceeding 50 mg/kg were detected at depths as deep as 2 feet BGS. In Excavation Area A total PCBs exceed 50 mg/kg up to 6 feet BGS. Accordingly, the initial excavation (i.e., prior to the performing confirmatory sampling) need to remove PCB concentrations above 50 mg/kg will be 1 foot deep over most of the excavation area, 2 feet deep in Excavation Area C, and 6 feet in Excavation Area A.

Based on our current understanding of PCB concentrations within the West PCB Area, only two areas are represented by soil samples with total PCB concentrations between 25 mg/kg and 50 mg/kg; these areas have been designated Excavation Areas D1 and D2. The proposed remediation program includes a 1-foot excavation in these three areas to eliminate surficial soils with total PCB concentrations greater than 25 mg/kg.

Two smaller areas within Excavation Areas B1 and D2 (OE-1 and OE-2) will be over-excavated (relative to the planned 1-foot excavations for these areas) to 2 feet BGS in order to remove 35.1mg/kg at SB-404 (to eliminate surficial soil concentrations above 25 mg/kg), and 21.2 mg/kg at SB-403 (to lower the Post Remediation average concentration for the excavated areas).

Note however, that the proposal to eliminate surficial soil with >25 mg/kg is intended to avoid needing to restrict access to the area with a fence by excavating and consolidating a relative small amount of soil. If confirmatory sampling performed during remediation indicates that significantly larger volumes of soil would need to be excavated to achieve a clean-up of 25 mg/kg or less, this effort will likely be abandoned and fencing will be erected as needed. In the event that total PCB concentrations between 25 mg/kg and 50 mg/kg remain, such areas will be enclosed in a fence in accordance with TSCA at 40 CFR 761.61(7)(a)(4)(B)(3), and will be marked with signs including the Large PCB Mark.

Similarly, if, during the course of the excavation and confirmatory sampling, it becomes apparent that it will not be feasible to reach the 50 mg/kg goal throughout the delineated excavation areas (due to the required depth of excavation, or the overall excavation volume), the proposed low permeability soil cap will be expanded to cover those areas where residual PCBs are >50 mg/kg and  $\leq$  100 mg/kg.

Based on current Site characterization results, a total upland soil excavation volume of approximately 2,670 cubic yards is anticipated. A confirmatory sampling program, as outlined in Appendix C, will then be implemented at the initial excavation sub-grade, and targeted deeper excavations will be implemented (followed by another round of confirmatory sampling) as needed to assess if residual concentrations in exposed soils (i.e., those not under the cap) are  $\leq$  25 mg/kg.

Following the completion of the excavations, and confirmation that residual soils meet the target clean-up goals, the excavation sub-grade and walls will be lined with a non-woven geo-textile fabric as a marker layer, then the excavations will be backfilled to a sub-grade approximately 6-inches below the original soil surface grade. The finished grade for most of the excavated area will be established using at least 6 inches of high-organic content, manufactured top soil. This area will then be seeded with conservation seed mix of native grass and broadleaf herbaceous plant species. The proposed cap over the disposal trenches will overlap with portions of the PCB excavation area. Those portions of the excavation area will be finished as discussed below.



According to documents received from W-G (Drawing No. C-4514; see Appendix D), the W5, W11 and W12 areas of concern, which overlap with the West PCB upland area, were used to bury various industrial waste materials from W-G's operations, including aluminum dross, solidified salt sludge used for heat treatments, and neutralized acid bath wastes. As part of the 2011 supplemental investigation of the West PCB Area, several observation trenches were dug to map the locations of these waste materials. That mapping effort indicated that the disposal trenches were generally south of the areas shown, and not laid out in the orderly fashion depicted on the historic plans. The locations of the waste materials observed during the supplemental investigation area shown on Figure 4.

As required by the MassDEP, the proposed footprint of low permeability cap was determined primarily based on the locations of the waste materials. The proposed soil cap will encompass approximately 43,584 sq.ft. (Figure 4) and will be constructed in a manner consistent with the requirements of 40 CFR 761.61(7) and 761.75(b)(1)(ii) through (b)(1)(v). The cap will be constructed of compacted, low permeability soil, overlain by a layer of common granular fill, which in turn will be overlain by high organic content, manufactured topsoil. This area will be seeded with a conservation seed mix, and will be mown (via brush-hog or equivalent) at least every three years to prevent the establishment of trees or shrubs capable of compromising the integrity of the soil cap.

The compacted soil cap layer shall achieve the following specifications:

- Achieve a final (compacted) thickness of 10-inches or greater.
- Achieve a permeability of  $1 \times 10^{-7}$  cm/sec or less.
- Constructed of mineral soils with 30% or greater, by weight, passing a No. 200 sieve.
- Exhibit a Liquid Limit greater than 30.
- Exhibit a Plasticity Index of greater than 15.

The manufactured topsoil layer shall meet the following specifications:

- Achieve a final (in place) thickness of at least 6 inches.
- Contain an organic carbon content of between 10 and 15 percent.

The actual extent of the cap will be determined based on results of the confirmatory sampling program (see Appendix C); e.g., the limits of the cap may be expanded slightly to cover, in place, soils with PCB concentrations  $>25$  mg/kg and  $\leq 100$  mg/kg.

## **6.00 POST REMEDIATION PCB CONCENTRATIONS**

The proposed remediation of the West PCB Area wetland will remove wetland soil from areas represented by samples that had total PCB concentrations above the clean-up goal of 9.5 mg/kg, which is protective of human health and ecological receptors. Thus, the remaining wetland soils will have PCB concentrations well below those that present a risk to humans or the environment.





The risk based clean up level that is protective of human trespassers exposed to upland soil is 55 mg/kg. The proposed remediation within the West PCB Area upland will remove, or consolidate and cap soils represented by samples that had more than 25 mg/kg total PCBs. Therefore, the remaining PCB concentrations within exposed upland soil will be well below the level that is protective of humans.

The clean-up goal for upland soil that is protective of wildlife that feed within the West Side is 1.22 mg/kg. The proposed remedial activities at the West PCB Area uplands will reduce the weighted average surficial soil PCB concentration to less than 1 mg/kg, which meets the ecological risk based clean-up goal. Backfill material for the West PCB and Small Pond remedial efforts will be tested for PCBs and will be accepted on-site only if PCBs are not detected. To account for this “clean” portion of the West PCB Area post-remediation, an area-weight average was used to estimate the average concentration of total PCBs in the post-remediation condition.

The West PCB Area is approximately 174,866 sq. ft., and the portion to be remediated by excavation and/or capping) is approximately 70,014 sq. ft., or about 40 percent. Therefore, the un-remediated portion is about 60 percent. The weighted average concentration of total PCBs to remain within the West PCB uplands following remediation will be less than 1.0 mg/kg. We have assumed backfill materials will be tested at a method detection limit of 0.05 mg/kg, and the assumed PCB level in the backfill material is 0.025 mg/kg (i.e., one-half the method detection limit).

Table 7 presents total PCB data for upland soil samples within the West PCB Area; the table also notes whether these samples will be removed or covered as part of the proposed remediation program, or whether these surficial soil samples will remain in place. Furthermore, Table 7 indicates those samples that represent soils deeper in the excavation areas (i.e., from 1 to 3 feet BGS) that will not be removed by the planned excavations. These data categories were used to calculate the West PCB Post Remediation Area Weighted Average as follows:

$$\text{West PCB AWA} = F_{\text{NR}} * \text{Ave}_{\text{NR}} + F_{\text{EA-A}} * \text{Ave}_{\text{EA-A}} + F_{\text{EA-B,C,D}} * (\text{Ave}_{1-3 \text{ ft}} * 0.66 + \text{Ave}_{0-1 \text{ ft}} * 0.33) + F_{\text{Cap}} * \text{Ave}_{\text{cap}}$$

Where:

West PCB AWA = Post remediation estimated West PCB Area Weighted Average surficial soil concentration (mg/kg of total PCBs)

$F_{\text{NR}}$  = Fraction of the West PCB Area Not to be Remediated = 105,852 sq.ft. un-remediated area / 174,866 total size of West PCB Area = 0.60

$\text{Ave}_{\text{NR}}$  = Average concentration of total PCBs in surficial (top 3 feet) soil samples in the area Not to be Remediated = 1.55 mg/kg.

$F_{\text{EA-A}}$  = Fraction of the West PCB Area comprised of Excavation Area A = 7034 sq.ft. / 174,866 sq.ft. = 0.04

$\text{Ave}_{\text{EA-A}}$  = Estimated post remediation average surficial soil total PCB concentration in Excavation Area A. This excavation will be approximately 6 feet deep, therefore post remediation soil was assumed to be clean with a PCB concentration of 0.0025



mg/kg, which is one-half the anticipated quantitation limit for tests to be performed on backfill material.

$F_{EA-B,C,D}$  = Fraction of the West PCB Area comprised of the uncapped portions of Excavation Areas B1, C, D1 and D2 = Area B1 (sq.ft.) + Area C (sq.ft.) + Area D1 (sq.ft.) + Area D2 (sq.ft.) – Overlap of Cap with Excavation Areas B1 and C / total West PCB Area = 13,485sq.ft. + 4308 sq.ft. + 1815 sq.ft. + 3781 sq.ft. – 4956 sq.ft. = 19,396 sq.ft. / 174,866 sq.ft. = 0.11.

$Ave_{1-3 \text{ ft}}$  = Average total PCB soil concentration in soils to remain in uncapped areas at depths of 1 to 3 feet BGS within Excavation Areas B1, C, D1 and D2. This values is multiplied by 0.66 to represent the bottom 2 feet of the defined 3 foot surficial soil depth = 0.59 mg/kg \* 0.66 = 0.39 mg/kg.

$Ave_{0-1 \text{ ft}}$  = Estimated post remediation average total PCB soil concentration in the top 1-foot in uncapped areas within Excavation Areas B1, C, D1 and D2. The average concentration in the backfill was assumed to be 0.0025 mg/kg; this values is multiplied by 0.33 to represent the top 1 foot of the defined 3 foot surficial soil depth = 0.0025 \* 0.33 = 8.25x10<sup>-4</sup> mg/kg.

$F_{Cap}$  = Fraction of the West PCB Area comprised of the proposed Cap Area = 43584 sq.ft. / 174,866 sq.ft. = 0.25

$Ave_{cap}$  = Estimated post remediation average surficial soil total PCB concentration in the cap materials, this concentration was assumed to be 0.0025 mg/kg.

Based on these calculations, the post remediation area weighted average for the upland portion of the West PCB Area is estimated to be 0.98 mg/kg (see Tables 7\_.

## 7.00 DEED RESTRICTIONS

Total PCB concentrations between 1mg/kg and 25 mg/kg will be left within the West PCB Area, both on W-G property as well as National Grid property along the transmission line easement. Allowing exposed soils with 1 mg/kg to 25 mg/kg to remain is allowable because this is a Low Occupancy Area in accordance with 40 CFR 761.61.3. A deed restriction will be placed on these properties to document the presence of PCBs and the designation of this area as a Low Occupancy<sup>11</sup> Area in accordance with 40 C FR 761.61(a)(8).

W-G will coordinate with National Grid, and will file the deed restriction on their behalf. The original deeds are recorded at the Worcester County Registry of deeds at Book 2565, Page 66 ( for the 244 Worcester Street property owned by Wyman-Gordon) and Book 7481, Page 368 (for the 230 Worcester Street property owned by National Grid).

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<sup>11</sup> For the MCP Method 3 Risk Characterization, GZA assumed that trespassers would be exposed to the West Side once per week during the 31 non-winter weeks. The likely, maximally exposed trespasser would be a child between 7 and 17 years of age. In accordance with the EPA Exposure Factors Handbook (2011 version) children in this age range spend about 2 hours per day playing outdoors. If it is assumed that a child spends one day per week during the 31 non-winter weeks playing on the West Side for 2 hours per event, that would total about 64 hours per year, or an average of 1.2 hours per month. These values are well below the TSCA Low Occupancy definition of less than 335 hours per year, or an average of 6.7 hours per week.



Within 60 days of the completion of the clean-up of the West PCB Area, W-G will file the required deed restriction(s) at the Worcester County Registry of Deeds, and will submit a certification to the EPA Region 1 Administrator notifying EPA that the required deed or deeds have been filed.



## 8.00 REFERENCES

- Commonwealth of Massachusetts. April 3, 2006. *Massachusetts Contingency Plan. 310 CMR 40.0000*. Massachusetts Department of Environmental Protection (MassDEP), Bureau of Waste Site Cleanup.
- GZA, 2002. Phase II Comprehensive Site Assessment Field Investigation, Western Area, Wyman-Gordon Company, North Grafton, Massachusetts. RTN 2-00535. Prepared by GZA GeoEnvironmental, Inc. of Norwood, Massachusetts. May 31, 2002.
- GZA, 2003. Risk Assessment Scope of Work, Wyman-Gordon Company, West Side Risk Characterization, Grafton/Millbury, Massachusetts. RTN 2-00535. Prepared by GZA GeoEnvironmental, Inc. of Norwood, Massachusetts. August 13, 2003.
- GZA, 2004. West PCB Area Imminent Hazard Evaluation. Wyman-Gordon Company, North Grafton, Massachusetts. RTN 2-00535. Prepared by GZA GeoEnvironmental, Inc. of Norwood, Massachusetts. August 24, 2004.
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- GZA, 2006. Release Abatement Measure (RAM) Plan for Remedial Pilot Study, West Side Impoundment, Wyman-Gordon Company, North Grafton, Massachusetts. RTN 2-0535. September 18, 2006
- GZA, 2007. Release Abatement Measure (RAM) Status Report #1, Remedial Pilot Study, West Side Impoundment, Wyman-Gordon Company, North Grafton, Massachusetts. RTN 2-0535. March 16, 2007.
- GZA, 2002. Release Abatement Measure (RAM) Completion Report, Wyman-Gordon Company, North Grafton, Massachusetts. RTN 2-0535. March 21, 2002.
- Wyman-Gordon, 1985. Wyman-Gordon Company's Response to EPA's Information Request for North Grafton and Millbury, Massachusetts Facilities, July 8, 1985.



## **TABLES**

TABLE 1  
UPLAND SOIL PCB RESULTS  
West PCB Area  
Wyman-Gordon Company  
244 Worcester Street  
North Grafton, Massachusetts

File No. 19274.03  
3/28/2012  
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			Aroclor 1268	Aroclor 1262	Aroclor 1260	Aroclor 1254	Aroclor 1248	Aroclor 1242	Aroclor 1242/1016	Aroclor 1232	Aroclor 1221	Aroclor 1016	Total PCBs	
Sample ID:		Depth:	Date:											
G-SS8		surficial	05/09/03	--	<0.05	<0.05	<0.05	<0.05	--	<0.05	<0.05	<0.05	--	<0.05
WGW-14	S-3A	10' - 11.5'	03/20/01	--	<0.025	<0.025	<0.025	<0.025	--	<0.025	<0.025	<0.025	--	<0.025
WGW-14	S-3AD*	10' - 11.5'	03/20/01	--	<0.025	<0.025	<0.025	<0.025	--	<0.025	<0.025	<0.025	--	<0.025
W10-TP2-S1	S1	6' - 8'	04/02/01	--	<5	<5	8.1	<5	--	<5	<5	<5	--	10.6
W18-TP1-S1*	S1	6' - 8'	04/02/01	--	<0.75	0.9	2.1	<0.75	--	<0.75	<0.75	<0.75	--	3
W10-TP5-S1	S1	6' - 7'	05/06/03	--	<0.05	<0.05	<0.05	<0.05	--	<0.05	<0.05	<0.05	--	<0.05
G-SS7		surficial	05/09/03	--	<0.1	0.14	0.2	<0.1	--	<0.1	<0.1	<0.1	--	0.34
G-SS5		surficial	04/04/01	--	<3	<3	3.2	<3	--	<3	<3	<3	--	4.7
G-TP4-S1	S1	1' - 2'	04/01/01	--	<150	<150	320	<150	--	<150	<150	<150	--	395
G-TP4-S2	S2	7.5' - 8.5'	04/02/01	--	<0.075	<0.075	0.17	<0.075	--	<0.075	<0.075	<0.075	--	0.2075
G-TP5-S1	S-1	0' - 1'	04/02/01	--	<750	1500	<750	<750	--	<750	<750	<750	--	1875
G-TP6-S2	S-2	2' - 3.5'	04/02/01	--	<0.1	0.27	<0.1	<0.1	--	<0.1	<0.1	<0.1	--	0.32
G-TP7-S2	S-2	6'	04/02/01	--	<0.025	0.075	<0.025	<0.025	--	<0.025	<0.025	<0.025	--	0.0875
G-SS6		surficial	05/09/03	--	<14	14	29	<14	--	<14	<14	<14	--	43
GSS-105		0' - 0.7'	06/08/04	--	<800	<800	4000	<800	--	<800	<800	<800	--	4400
GSS-106		0' - 0.7'	06/08/04	--	<0.8	<0.8	2.2	<0.8	--	<0.8	<0.8	<0.8	--	2.6
GSS-107		0' - 0.7'	06/08/04	--	<100	<100	260	<100	--	<100	<100	<100	--	310
GSS-108		0' - 0.5'	06/08/04	--	<500	<500	2000	<500	--	<500	<500	<500	--	2250
G-SS4		surficial	04/04/01	--	<0.005	0.0084	0.0082	<0.005	--	<0.005	<0.005	<0.005	--	0.0166
ST2-SS1		0' - 0.3'	10/21/04	--	<2	<2	8	<2	--	<2	<2	<2	--	9
ST2-SS2**		0' - 0.5'	10/21/04	--	<0.1	0.24	0.23	<0.1	--	<0.1	<0.1	<0.1	--	0.47
GSS-201		surficial	10/21/04	--	<50	<50	210	<50	--	<50	<50	<50	--	235
GSS-202		surficial	10/21/04	--	<1	<1	5	<1	--	<1	<1	<1	--	5.5
GSS-203		surficial	10/21/04	--	<60	<60	140	<60	--	<60	<60	<60	--	170
GSS-205**		surficial	10/21/04	--	<0.5	1.4	2.1	<0.5	--	<0.5	<0.5	<0.5	--	3.5
GSS-206**		surficial	10/21/04	--	<0.25	0.31	0.43	<0.25	--	<0.25	<0.25	<0.25	--	0.74
GSS-207		surficial	10/21/04	--	<1	<1	4.4	<1	--	<1	<1	<1	--	4.9
GSS-208		surficial	10/21/04	--	<2	<2	7.4	<2	--	<2	<2	<2	--	8.4
GSS-105D		3.5'	10/21/04	--	<30	<30	78	<30	--	<30	<30	<30	--	93
GSS-107D		3.5'	10/21/04	--	<6	<6	13	<6	--	<6	<6	<6	--	16
GSS-209		0.1' - 0.5'	12/03/04	--	<0.15	<0.15	0.31	<0.15	--	<0.15	<0.15	<0.15	--	0.385
GSS-210		0.1' - 0.8'	12/03/04	--	<0.025	<0.025	<0.025	<0.025	--	<0.025	<0.025	<0.025	--	<0.025
SS - 301		0' - .25'	05/04/07	<0.35	<0.35	0.37	<0.35	<0.35	--	<0.35	<0.35	<0.35	--	0.545
SS - 302		0' - .25'	05/04/07	<0.3	<0.3	0.46	0.48	<0.3	--	<0.3	<0.3	<0.3	--	0.94
SS - 303		0' - .25'	05/04/07	<170	<170	<170	430	<170	--	<170	<170	<170	--	515
SS - 304		0' - .25'	05/04/07	<12	<12	<12	35	<12	--	<12	<12	<12	--	41
SB-101 S-1		0' - 1'	11/2/2011	<0.0560	<0.0560	0.717	<0.0560	<0.0560	--	<0.0560	<0.0560	<0.0560	--	0.745
SB-102 S-2		1' - 2'	11/2/2011	<0.0535	<0.0535	<0.0535	<0.0535	<0.0535	--	<0.0535	<0.0535	<0.0535	--	0.0535
SB-103 S-2		1' - 2'	11/2/2011	<30.1	<30.1	<30.1	487	<30.1	--	<30.1	<30.1	<30.1	--	502
SB-103 S-3		2' - 4'	11/2/2011	<2.88	<2.88	<2.88	24.0	<2.88	--	<2.88	<2.88	<2.88	--	25.4
SB-104 S-2		1' - 2'	11/2/2011	<0.0577	<0.0577	0.459	1.89	<0.0577	--	<0.0577	<0.0577	<0.0577	--	2.35
SB-104 S-3		2' - 4'	11/2/2011	<0.0532	<0.0532	<0.0532	<0.0532	<0.0532	--	<0.0532	<0.0532	<0.0532	--	0.0532
SB-105 S-1		0' - 1'	11/2/2011	<0.0613	<0.0613	0.562	3.50	<0.0613	--	<0.0613	<0.0613	<0.0613	--	4.06
SB-105 S-3		2' - 4'	11/2/2011	<0.0697	<0.0697	0.667	5.78	<0.0697	--	<0.0697	<0.0697	<0.0697	--	6.45
SB-106 S-1		0' - 1'	11/2/2011	<0.0616	<0.0616	0.323	1.18	<0.0616	--	<0.0616	<0.0616	<0.0616	--	1.5
SB-201 S-1		0' - 1'	11/2/2011	<0.0735	<0.0735	1.47	0.688	<0.0735	--	<0.0735	<0.0735	<0.0735	--	2.16
SB-201 S-3		2' - 4'	11/2/2011	<0.0543	<0.0543	<0.0543	<0.0543	<0.0543	--	<0.0543	<0.0543	<0.0543	--	0.0543
SB-202 S-2		1' - 2'	11/2/2011	<0.0591	<0.0591	0.110	0.199	<0.0591	--	<0.0591	<0.0591	<0.0591	--	0.309
SB-203 S-1		0' - 1'	11/2/2011	<12.8	<12.8	<12.8	108	<12.8	--	<12.8	<12.8	<12.8	--	114
SB-203 S-3		2' - 4'	11/2/2011	<1.15	<1.15	<1.15	10.8	<1.15	--	<1.15	<1.15	<1.15	--	11.4
SB-204 S-1		0' - 1'	11/2/2011	<0.0725	<0.0725	<0.0725	2.48	<0.0725	--	<0.0725	<0.0725	<0.0725	--	2.52
SB-204 S-3		2' - 4'	11/2/2011	<0.0521	<0.0521	0.137	0.152	<0.0521	--	<0.0521	<0.0521	<0.0521	--	0.289
SB-205 S-2		1' - 2'	11/2/2011	<0.0575	<0.0575	0.0947	0.235	<0.0575	--	<0.0575	<0.0575	<0.0575	--	0.33

TABLE 1  
UPLAND SOIL PCB RESULTS  
West PCB Area  
Wyman-Gordon Company  
244 Worcester Street  
North Grafton, Massachusetts

File No. 19274.03  
3/28/2012  
Page 2 of 2

Sample ID:	Depth:	Date:	Aroclor 1268	Aroclor 1262	Aroclor 1260	Aroclor 1254	Aroclor 1248	Aroclor 1242	Aroclor 1242/1016	Aroclor 1232	Aroclor 1221	Aroclor 1016	Total PCBs
SB-205 S-3	2' - 4'	11/2/2011	<0.0579	<0.0579	0.177	0.163	<0.0579	<0.0579	--	<0.0579	<0.0579	<0.0579	0.34
SB-206 S-1	0' - 1'	11/2/2011	<0.0681	<0.0681	0.150	0.814	<0.0681	<0.0681	--	<0.0681	<0.0681	<0.0681	0.964
SB-301 S-1	0' - 1'	11/2/2011	<0.0714	<0.0714	0.331	0.236	<0.0714	<0.0714	--	<0.0714	<0.0714	<0.0714	0.567
SB-302 S-1	0' - 1'	11/2/2011	<0.0680	<0.0680	1.10	6.99	<0.0680	<0.0680	--	<0.0680	<0.0680	<0.0680	8.09
SB-302 S-3	2' - 4'	11/2/2011	<0.0568	<0.0568	<0.0568	<0.0568	<0.0568	<0.0568	--	<0.0568	<0.0568	<0.0568	0.0568
SB-303 S-1	0' - 1'	11/2/2011	<33.1	<33.1	<33.1	178	<33.1	<33.1	--	<33.1	<33.1	<33.1	195
SB-303 S-3	2' - 4'	11/2/2011	<0.0570	<0.0570	<0.0570	<0.0570	<0.0570	<0.0570	--	<0.0570	<0.0570	<0.0570	0.057
SB-304 S-2	1' - 2'	11/2/2011	<0.0593	<0.0593	0.309	0.727	<0.0593	<0.0593	--	<0.0593	<0.0593	<0.0593	1.04
SB-305 S-2	1' - 2'	11/3/2011	<0.0632	<0.0632	<0.0632	1.07	<0.0632	<0.0632	--	<0.0632	<0.0632	<0.0632	1.1
SB-306 S-1	0' - 1'	11/3/2011	<0.0627	<0.0627	0.125	0.167	<0.0627	<0.0627	--	<0.0627	<0.0627	<0.0627	0.292
SB-307 S-1	0' - 1'	11/3/2011	<0.0557	<0.0557	<0.0557	0.444	<0.0557	<0.0557	--	<0.0557	<0.0557	<0.0557	0.472
SB-307 S-3	2' - 4'	11/3/2011	<0.0554	<0.0554	0.410	0.982	<0.0554	<0.0554	--	<0.0554	<0.0554	<0.0554	1.39
SB-308 S-3	2' - 4'	11/3/2011	<0.0613	<0.0613	0.258	0.764	<0.0613	<0.0613	--	<0.0613	<0.0613	<0.0613	1.02
SB-308 S-5	6' - 8'	11/3/2011	<0.0638	<0.0638	<0.0638	0.0660	<0.0638	<0.0638	--	<0.0638	<0.0638	<0.0638	0.0979
SB-401 S-1	0' - 1'	11/3/2011	<0.0755	<0.0755	0.161	0.358	<0.0755	<0.0755	--	<0.0755	<0.0755	<0.0755	0.519
SB-402 S-2	1' - 2'	11/3/2011	<0.0624	<0.0624	<0.0624	<0.0624	<0.0624	<0.0624	--	<0.0624	<0.0624	<0.0624	0.0624
SB-403 S-2	1' - 2'	11/3/2011	<1.13	<1.13	9.77	11.4	<1.13	<1.13	--	<1.13	<1.13	<1.13	21.2
SB-404 S-1	0' - 1'	11/3/2011	<30.3	<30.3	<30.3	226	<30.3	<30.3	--	<30.3	<30.3	<30.3	241
SB-404 S-3	2' - 4'	11/3/2011	<0.0586	<0.0586	0.372	2.75	<0.0586	<0.0586	--	<0.0586	<0.0586	<0.0586	3.12
SB-405 S-2	1' - 2'	11/3/2011	<0.0589	<0.0589	<0.0589	<0.0589	<0.0589	<0.0589	--	<0.0589	<0.0589	<0.0589	0.0589
SB-406 S-1	0' - 1'	11/3/2011	<0.0758	<0.0758	<0.0758	9.85	<0.0758	<0.0758	--	<0.0758	<0.0758	<0.0758	9.89
SB-407 S-1	0' - 1'	11/3/2011	<0.0579	<0.0579	<0.0579	<0.0579	<0.0579	<0.0579	--	<0.0579	<0.0579	<0.0579	0.0579
SB-407 S-5	6' - 8'	11/3/2011	<1.77	<1.77	6.55	20.1	<1.77	<1.77	--	<1.77	<1.77	<1.77	26.7
SB-501 S-1	0' - 1'	11/3/2011	<0.0722	<0.0722	0.253	0.318	<0.0722	<0.0722	--	<0.0722	<0.0722	<0.0722	0.571
SB-501 S-3	2' - 4'	11/3/2011	<0.0680	<0.0680	<0.0680	<0.0680	<0.0680	<0.0680	--	<0.0680	<0.0680	<0.0680	0.068
SB-502 S-1	0' - 1'	11/3/2011	<34.3	<34.3	256	<34.3	<34.3	<34.3	--	<34.3	<34.3	<34.3	273
SB-502 S-3	2' - 4'	11/3/2011	<0.0706	<0.0706	<0.0706	<0.0706	<0.0706	<0.0706	--	<0.0706	<0.0706	<0.0706	0.0706
SB-503 S-3	6' - 8'	11/3/2011	<1.32	<1.32	<1.32	23.5	<1.32	<1.32	--	<1.32	<1.32	<1.32	24.2
SB-503 S-4 8	8' - 10'	11/3/2011	<0.0842	<0.0842	<0.0842	0.144	<0.0842	<0.0842	--	<0.0842	<0.0842	<0.0842	0.186
SB-504 S-2	1' - 2'	11/3/2011	<0.0617	<0.0617	<0.0617	0.133	<0.0617	<0.0617	--	<0.0617	<0.0617	<0.0617	0.164
SB-504 S-3	5' - 6'	11/3/2011	<0.0606	<0.0606	0.114	0.401	<0.0606	<0.0606	--	<0.0606	<0.0606	<0.0606	0.515
SB-504 S-4	6' - 8'	11/3/2011	<0.0814	<0.0814	<0.0814	<0.0814	<0.0814	<0.0814	--	<0.0814	<0.0814	<0.0814	0.0814
SB-505 S-1	0' - 1'	11/3/2011	<0.0636	<0.0636	8.14	11.3	<0.0636	<0.0636	--	<0.0636	<0.0636	<0.0636	19.4
SB-505 S-3	2' - 4'	11/3/2011	<0.0641	<0.0641	7.02	6.84	<0.0641	<0.0641	--	<0.0641	<0.0641	<0.0641	13.9
SB-506 S-1	0' - 1'	11/3/2011	<0.0606	<0.0606	0.165	0.426	<0.0606	<0.0606	--	<0.0606	<0.0606	<0.0606	0.591
SB-507 S-1	0' - 1'	11/3/2011	<0.0566	<0.0566	<0.0566	0.892	<0.0566	<0.0566	--	<0.0566	<0.0566	<0.0566	0.92
SB-508 S-1	0' - 1'	11/3/2011	<0.0638	<0.0638	0.288	0.502	<0.0638	<0.0638	--	<0.0638	<0.0638	<0.0638	0.79
SB-508 S-3	2' - 4'	11/3/2011	<0.0535	<0.0535	<0.0535	<0.0535	<0.0535	<0.0535	--	<0.0535	<0.0535	<0.0535	0.0535
SB-601 S-1	0' - 1'	11/3/2011	<0.0699	<0.0699	1.05	0.613	<0.0699	<0.0699	--	<0.0699	<0.0699	<0.0699	1.66
SB-602 S-2	1' - 2'	11/3/2011	<295	<295	3430	<295	<295	<295	--	<295	<295	<295	3580
SB-602 S-3	5' - 6'	11/3/2011	<70.6	<70.6	1300	<70.6	<70.6	<70.6	--	<70.6	<70.6	<70.6	1340
SB-603 S-3	2' - 4'	11/3/2011	<58.2	<58.2	374	<58.2	<58.2	<58.2	--	<58.2	<58.2	<58.2	403
SB-603 S-5	6' - 8'	11/3/2011	<0.0625	<0.0625	1.66	<0.0625	<0.0625	<0.0625	--	<0.0625	<0.0625	<0.0625	1.69

Notes:

- Results are shown in mg/kg
- "--" indicates that the analyte was not analyzed.
- These analyses were performed via EPA method 8028/3541

TABLE 2  
WETLAND SOIL AND SEDIMENT PCB RESULTS  
West PCB Area  
Wyman-Gordon Company  
244 Worcester Street  
North Grafton, Massachusetts

File No. 19274.04  
3/28/2012  
Page 1 of 1

Sample ID:	Depth:	Date:	Aroclor 1268	Aroclor 1262	Aroclor 1260	Aroclor 1254	Aroclor 1248	Aroclor 1242/101	Aroclor 1232	Aroclor 1221	Total PCBs
SED-5B	0.5' - 1.5'	03/28/01	--	<250	<250	510	<250	<250	<250	<250	635
SED-10B*	1'	04/20/01	--	<50	<50	230	<50	<50	<50	<50	255
SED-11B*	2.5'	04/20/01	--	<2	<2	5.6	<2	<2	<2	<2	6.6
SED-12B*	1.5'	04/20/01	--	<200	<200	710	<200	<200	<200	<200	810
SED-13B*	1'	04/20/01	--	<500	<500	1100	<500	<500	<500	<500	1350
SED-14B*	1'	04/20/01	--	<4	<4	8.4	<4	<4	<4	<4	10.4
SED-15B*	1'	04/20/01	--	<0.13	<0.13	0.16	<0.13	0.26	<0.13	<0.13	0.485
SED-16B*	2'	04/20/01	--	<1.5	1.6	2.2	<1.5	<1.5	<1.5	<1.5	3.8
SED-17B*	1.5'	04/20/01	--	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	1.35
SED-18B*	1'	04/20/01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SED-19B*	1'	04/20/01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SED-20B*	1'	04/20/01	--	<0.025	0.032	0.043	<0.025	<0.025	<0.025	<0.025	0.075
SED-21B*	1.5'	04/20/01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SED-22B*	1.5'	04/20/01	--	<0.25	0.26	0.53	<0.25	<0.25	<0.25	<0.25	0.79
SED-25B*	1.5'	04/20/01	--	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	0.017
SED-26C	surficial	04/30/03	--	<5	<5	16	<5	<5	<5	<5	18.5
SED-27C	surficial	04/30/03	--	<63	<63	1800	<63	<63	<63	<63	1831.5
SED-28C	surficial	04/30/03	--	<50	<50	120	<50	<50	<50	<50	145
SED-29C	surficial	05/09/03	--	<1.8	1.9	2.8	<1.8	<1.8	<1.8	<1.8	4.7
SED-30C	surficial	05/09/03	--	<0.25	0.31	<0.25	<0.25	<0.25	<0.25	<0.25	0.435
SED - 228C	surficial	10/29/04	--	<75	<75	140	<75	<75	<75	<75	177.5
SED - 229C	surficial	10/29/04	--	<15	<15	40	<15	<15	<15	<15	47.5
SED-6B	0' - 1'	03/28/01	--	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
SED-23B*	1.5'	04/20/01	--	<0.01	0.011	0.015	<0.01	<0.01	<0.01	<0.01	0.026
SED-24B*	1'	04/20/01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SED-31C	surficial	05/09/03	--	<0.7	0.74	1.1	<0.7	<0.7	<0.7	<0.7	1.84
SED-231C	surficial	10/27/04	--	<0.5	<0.5	0.75	<0.5	<0.5	<0.5	<0.5	1
SED - 301A	0' - 0.8'	05/04/07	<2.5	<2.5	<2.5	6.20	<2.5	<2.5	<2.5	<2.5	7.45
SED - 302A	0' - 0.75'	05/04/07	<0.15	<0.15	<0.15	0.36	<0.15	<0.15	<0.15	<0.15	0.435
SED - 303A	0.2' - 0.6'	05/04/07	<0.15	<0.15	<0.15	0.17	<0.15	<0.15	<0.15	<0.15	0.245
SED - 304A	0' - 0.75'	05/04/07	<0.3	<0.3	<0.3	0.73	<0.3	<0.3	<0.3	<0.3	0.88
SED - 305	0.2' - 1.1'	05/04/07	<0.7	<0.7	<0.7	2.20	<0.7	<0.7	<0.7	<0.7	2.55
SED - 306	2.4' - 2.9'	05/04/07	<0.8	<0.8	<0.8	2.90	<0.8	<0.8	<0.8	<0.8	3.3

Notes:

- Results are shown in mg/kg
- "--" indicates that the analyte was not analyzed.
- These analyses were performed via EPA method 8028/3541
- \* indicates that the laboratory report for these samples (Appendix B) shows the sample names in the form SB-# rather than SED-#B as shown in this table and on the Site plans.

TABLE 3  
GROUNDWATER PCB RESULTS  
West PCB Area  
Wyman-Gordon Company  
244 Worcester Street  
North Grafton, Massachusetts

File No. 19274.03

Page 1 of 1

3/28/2012

Sample Location:	Date Collected:	Aroclor 1221	Aroclor 1232	Aroclor 1242/1016	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Total PCBs
WGW-7	12/26/00	<0.5	<0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5
WGW-7	03/26/01	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
WGW-14	03/26/01	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PZ-4	04/04/01	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PZ-5	04/04/01	<0.5	<1	<0.5	<0.5	0.7	<0.5	<0.5	0.95
PZ-5	05/16/01	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Notes:

1. Results are shown in  $\mu\text{g/L}$
2. "--" indicates that the analyte was not analyzed.
3. These analyses were performed via EPA method 8028/3541

**TABLE 4**  
**HUMAN HEALTH RISK-BASED CONCENTRATION LIMIT CALCULATIONS**  
**CURRENT CONDITION EXPOSURES**  
 West Side  
 Wyman-Gordon Company  
 244 Worcester Street  
 North Grafton, Massachusetts

File No . 19274.03  
 Page 1 of 2  
 4/19/2011

**Receptor-Specific Exposure Assumptions**

Parameter	Description	Units	Trespasser Receptor Group
BW	Body Weight	kg	41
AP <sub>non-cancer</sub>	Averaging Period - Non Cancer	days	2,920
AP <sub>cancer</sub>	Averaging Period - Cancer	days	27,375
EF	Exposure Frequency	events/year	31
ED	Exposure Duration	day/event	1
EP	Exposure Period	years	8
C	Conversion Factor	kg/mg	1.0E-06
DCR <sub>soil</sub>	Soil Dermal Contact Rate	mg/kg	403
DCR <sub>wetland soil</sub>	Wetland Soil Dermal Contact Rate	mg/kg	2928
IR <sub>soil</sub>	Soil Ingestion Rate	mg/day	50.7
IR <sub>wetland soil</sub>	Wetland Soil Ingestion Rate	mg/day	50

**Chemical-Specific Exposure Assumptions**

Parameter	Description	Units	Polychlorinated Biphenyls
RfD	Reference Dose	(mg/kg-day)	0.00002
CSF	Cancer Slope Factor	(mg/kg-day) <sup>-1</sup>	2.0
RAF <sub>dermal-nc</sub>	Dermal Relative Absorption Factor - Non Cancer	unitless	0.067
RAF <sub>dermal-c</sub>	Dermal Relative Absorption Factor - Cancer	unitless	0.067
RAF <sub>oral-nc</sub>	Oral Relative Absorption Factor - Non Cancer	unitless	0.16
RAF <sub>oral</sub>	Oral Relative Absorption Factor - Cancer	unitless	0.16

(cont. on next page)

**TABLE 4**  
**HUMAN HEALTH RISK-BASED CONCENTRATION LIMIT CALCULATIONS**  
**CURRENT CONDITION EXPOSURES**

File No . 19274.03  
Page 2 of 2  
4/19/2011

West Side  
Wyman-Gordon Company  
244 Worcester Street  
North Grafton, Massachusetts

**Human Health Risk-Based Clean-up Calculations**

Non-cancer:

$$RBCL_{soil / wetland soil} = \frac{HI_{target} * BW * AP * RfD}{EF * ED * EP * C} [DCR_{soil / wetland soil} * RAF_{dermal} + IR_{soil / wetland soil} * RAF_{oral}]$$

Cancer:

$$RBCL_{soil / wetland soil} = \frac{ELCR_{target} * BW * AP}{EF * ED * EP * C * CSF} [DCR_{soil / wetland soil} * RAF_{dermal} + IR_{soil / wetland soil} * RAF_{oral}]$$

Where:

Parameter	Description	Units
$RBCL_{soil}$	Risk Based Concentration Limit in Soil	mg/kg
$RBCL_{wetland soil}$	Risk Based Concentration Limit in Wetland Soil/Sediment	mg/kg
$HI_{target}$	Target Non-Cancer Risk	Unitless
$ELCR_{target}$	Target Excess Lifetime Cancer Risk	Unitless
BW	Body Weight	Kg
AP	Averaging Period	Days
EF	Exposure Frequency	events/year
ED	Exposure Duration	day/event
EP	Exposure Period	Years
C	Conversion Factor	kg/mg
RfD	Reference Dose	(mg/kg-day)
CSF	Cancer Slope Factor	(mg/kg-day) <sup>-1</sup>
$DCR_{soil}$	Soil Dermal Contact Rate	mg/kg
$DCR_{wetland soil}$	Wetland Soil Dermal Contact Rate	mg/kg
$RAF_{dermal}$	Dermal Relative Absorption Factor	Unitless
$IR_{soil}$	Soil Ingestion Rate	mg/day
$IR_{wetland soil}$	Wetland Soil Ingestion Rate	mg/day
$RAF_{oral}$	Oral Relative Absorption Factor	Unitless



**TABLE 5**  
**ECOLOGICAL RISK-BASED CONCENTRATION LIMIT CALCULATIONS**  
 West Side  
 Wyman-Gordon Company  
 244 Worcester Street  
 North Grafton, Massachusetts

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 Page 1 of 2  
 3/14/2011

**Exposure Assumptions**

	Wetland Soil & Sediment		Upland Soil	
	Short-tailed Shrew	Marsh Wren	Short-tailed Shrew	American robin
TRD	0.42	0.99	0.42	0.99
FA	1	1	1	1
BF	1	1	1	1
IR <sub>b-invert</sub>	0.44	0.33	0.44	0.1
BAF <sub>b-invert</sub>	0.124	0.124	0.92	0.92
FS <sub>b-invert</sub>	0.075	0.01	0.075	0.075
IR <sub>ae-invert</sub>	0.16	0.64	0.16	0.18
IR <sub>plant</sub>	0.11	na	0.11	0.52
BAF <sub>ae-invert/plant</sub>	0.007	0.007	0.007	0.007
FS <sub>ae-invert/plant</sub>	0.01	0.01	0.01	0.01
OHM <sub>wet wgt</sub>	4.56	17.97	0.95	8.89
Percent Solid	0.41	0.41	0.78	0.78
Target Clean-up Goal (dry wght)	11.1	43.8	1.22	11.4

**Ecological Risk-Based Clean Up Level Calculations**

The food web assessment presented in the Phase II was used to back-calculate target remediation goals for soil, wetland soil, and sediment. In the Phase II Report, exposure of marsh wren, American robin and short-tailed shrew to contaminants of potential ecological concern were estimated using the following formula:

$$ADD_{mg/kg/day} = FA \times BF \times ((IR_{b-invert} \times (OHM_{b-invert} + OHM_{wet} \times FS_{b-invert})) + (IR_{ae-invert} \times (OHM_{ae-invert} + OHM_{sed} \times FS_{ae-invert})) + (IR_{plant} \times (OHM_{plant} + OHM_{soil} \times FS_{soil/plant})))$$

Where:

- ADD<sub>mg/kg/day</sub> = Average Daily Dose of contaminant to the receptor based on mg/kg of body weight/day.
- OHM<sub>b-invert</sub> = Average concentration of contaminant in benthic or soil invertebrates (wet weight basis).
- OHM<sub>ae-invert</sub> = Average concentration of contaminant in aerial or epiphytic invertebrates (wet weight basis).
- OHM<sub>plant</sub> = Average concentration of contaminant in wetland plants (wet weight basis).
- OHM<sub>wet</sub> = Average concentration of contaminant in soil, wetland soil, or sediment (wet weight basis).

(cont. next page)

**TABLE 5**  
**ECOLOGICAL RISK-BASED CONCENTRATION LIMIT CALCULATIONS**  
 West Side  
 Wyman-Gordon Company  
 244 Worcester Street  
 North Grafton, Massachusetts

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IR <sub>b-invert</sub>	=	Ingestion rate of benthic or soil invertebrates in kg/kg body weight/day.
IR <sub>ae-invert</sub>	=	Ingestion rate of aerial or epiphytic invertebrates (e.g. those that live on plants) in kg/kg body weight/day.
IR <sub>plant</sub>	=	Ingestion rate of plants in kg/kg body weight/day.
FS <sub>b-invert</sub>	=	Fraction of benthic or soil invertebrate body weight which is composed of soil.
FS <sub>ae-invert</sub>	=	Fraction of aerial or epiphytic invertebrate body weight which is composed of soil.
FS <sub>plant</sub>	=	Fraction of ingested plant matter which is composed of soil.
FA	=	The fraction of the receptor's foraging area comprised by Site.
BF	=	Bioavailable Fraction, or the fraction of the contaminant mass in food items or incidentally ingested soil or sediment that is digested and taken up by the gut of the exposed receptor.

The fully expanded version of this formula was used in the Stage II ERC tables in order to identify which food item contributes most to the estimated exposure, and to facilitate the use of bioaccumulation factors (BAFs) to estimate tissue concentrations in food items. The fully expanded version of the formula is as follows:

$$ADD_{mg/kg/d} = (FA * BF * IR_{b-invert} * (OHM_{b-invert} + (OHM_{wet} + FS_{b-invert}))) + (FA * BF * IR_{ae-invert} * (OHM_{ae-invert} + (OHM_{wet} + FS_{ae-invert/plant}))) + (FA * BF * IR_{plant} * (OHM_{plant} + (OHM_{wet} + FS_{ae-invert/plant})))$$

Expanding the formula to reflect that tissue concentrations are estimated using BAFs results in:

$$ADD_{mg/kg/day} = (FA * BF * IR_{b-invert} * ((BAF_{b-invert} * OHM_{wet}) + (OHM_{wet} * FS_{b-invert}))) + (FA * BF * IR_{ae-invert} * ((BAF_{ae-invert/plant} * OHM_{wet}) + (OHM_{wet} * FS_{ae-invert/plant}))) + (FA * BF * IR_{plant} * ((BAF_{ae-invert/plant} * OHM_{wet}) + (OHM_{wet} * FS_{ae-invert/plant})))$$

Substituting the Toxicity Reference Dose (TRD, which is the dose considered to be protective of the receptor) for ADD, and simplifying to solve for the OHM<sub>wet</sub> value which results in an estimated dose equal to the TRD results in:

$$OHM_{wet} = \frac{TRD_{mg/kg/day}}{FA * BF * [IR_{b-invert} * (BAF_{b-inv} + FS_{b-invert}) + (BAF_{ae-invert/plant} + FS_{ae-invert/plant}) * (IR_{a-inv} + IR_{plant})]}$$

The RBCL can then be calculated, on a dry weight basis, as:

$$RBCL_{dry\ wg} = OHM_{wet} / fraction\ solid$$

**TABLE 6**  
**SELECTION OF RISK-BASED CLEAN UP GOALS**  
 West Side  
*Wyman-Gordon Company*  
 244 Worcester Street  
 North Grafton, Massachusetts

	Contaminant	PCBs
Medium	Receptor	
Upland Soil	<b>Human Receptors</b>	
	Trespasser	
	Non Cancer	55
	Cancer	64
	<b>Ecological Receptors</b>	
	Short-tailed Shrew	1.2
	American Robin	11.4
	Mass DEP Background for Natural Soil	NA
	Site Specific Background (average)	NA
	<b>Risk-Based Clean Up Goals</b>	<b>1.22</b>
Wetland Soil/Sediment	<b>Human Receptors</b>	
	Trespasser	
	Non-Cancer	9.5
	Cancer	11
	<b>Ecological Receptors</b>	
	Short-tailed Shrew (Wetland Soil)	11
	Marsh Wren (Sediment)	43.8
	<b>Risk-Based Clean Up Goals</b>	<b>9.5</b>

Notes:

1. Concentrations are presented in units of milligrams per kilogram (mg/kg).
2. NA = not applicable; NC = not calculated; < = less than the method detection limit.
3. Risk-based concentration limits for wetland soil/sediment were based on the following criteria:
  - a. Human receptor exposure to wetland soil and sediment was assumed to be identical. If the human health risk based concentration for wetland soil and sediment was the lowest calculated value, then this was selected as the Risk-Based Clean Up Goal.
  - b. Ecological receptor exposure to wetland soil and sediment was evaluated separately for short-tailed shrew and marsh wren, respectively. If an ecological risk-based concentration limit for one of these media was the lowest calculated value for a given constituent, then the lowest human health risk-based concentration limit or ecological risk-based concentration limit for the other media (wetland soil or sediment) was also evaluated.
4. A Risk-Based Clean Up Goal in parentheses indicates either the next lowest human health risk-based concentration limit, or ecological risk-based concentration limit for wetland soil/sediment.

TABLE 7

File No. 19274.08

3/7/2012

Upland Soil PCB Concentrations within West PCB Area and  
Calculation of Post Remediation Area Weight Averages

Page 1 of 4

	Sample Location	Sample ID:	Depth (ft)	Total PCBs
To Be Removed by Excavation	SB-202	S-1	0 to 1	27.2
	SS - 304		surficial	41
	GSS-105		0 to 0.7	4400
	GSS-107		0 to 0.7	310
	GSS-108		0 to 0.5	2250
	GSS-201		surficial	235
	GSS-203		surficial	170
	G-SS6		surficial	43
	G-TP5-S1	S-1	0 to 1	1875
	SB-203	S-1	0 to 1	114
	SB-303	S-1	0 to 1	195
	SB-402	S-1	0 to 1	53.5
	SB-403	S-1	0 to 1	28.5
	SB-404	S-1	0 to 1	241
	SB-404	S-2	1 to 2	35.1
	SB-502	S-1	0 to 1	273
	SS - 303		surficial	515.00
	ST2-SS1		0 to 0.3	9
	G-TP4-S1	S1	1 to 2	395
	SB-103	S-2	1 to 2	502
	SB-203	S-2	1 to 2	79.4
	SB-503	S-2	1 to 2	283
	SB-602	S-2	1 to 2	3580
	SB-603	S-3	2 to 4	403
	GSS-105D		3.5	93
	SB-602	S-4	4 to 6	1340
	SB-603	S-4	4 to 6	1150
	SB-403	S-2	1 to 2	21.2
To Remain Uncovered within Excavation Areas B,C and D w/in 1' to 3' BGS	SB-202	S-2	1 to 2	0.309
	SB-303	S-2	1 to 2	0.424
	SB-303	S-3	2 to 4	<0.0570
	SB-402	S-2	1 to 2	<0.0624
	SB-404	S-3	2 to 4	3.12
	SB-502	S-3	2 to 4	<0.0706
	SB-504	S-2	1 to 2	0.164

TABLE 7

File No. 19274.08

3/7/2012

Upland Soil PCB Concentrations within West PCB Area and  
Calculation of Post Remediation Area Weight Averages

Page 2 of 4

	Sample Location	Sample ID:	Depth (ft)	Total PCBs
To Be Covered by Low Permeability Cap	GSS-202		surficial	5.50
	G-SS5		surficial	4.70
	G-SS7		surficial	0.34
	G-SS8		surficial	<0.05
	SB-104	S-1	0 to 1	22.2
	SB-105	S-1	0 to 1	4.06
	SB-106	S-1	0 to 1	1.5
	SB-204	S-1	0 to 1	2.52
	SB-205	S-1	0 to 1	0.631
	SB-206	S-1	0 to 1	0.964
	SB-304	S-1	0 to 1	35.2
	SB-306	S-1	0 to 1	0.292
	SB-307	S-1	0 to 1	0.472
	SB-405	S-1	0 to 1	2.88
	SB-406	S-1	0 to 1	9.89
	SB-407	S-1	0 to 1	<0.0579
	SB-505	S-1	0 to 1	19.4
	SB-506	S-1	0 to 1	0.591
	SB-507	S-1	0 to 1	0.92
	ST2-SS2**		0 to 0.5	0.47
	SS-CP-4**		0.2	0.31
	SB-104	S-2	1 to 2	2.35
	SB-204	S-2	1 to 2	0.942
	SB-205	S-2	1 to 2	0.33
	SB-304	S-2	1 to 2	1.04
	SB-305	S-2	1 to 2	1.1
	SB-405	S-2	1 to 2	<0.0589
	SB-104	S-3	2 to 4	<0.0532
	SB-105	S-3	2 to 4	6.45
	SB-204	S-3	2 to 4	0.289
	SB-205	S-3	2 to 4	0.34
	SB-307	S-3	2 to 4	1.39
	SB-308	S-3	2 to 4	1.02
	SB-505	S-3	2 to 4	13.9
	SB-103	S-3	2 to 4	25.4
	SB-203	S-3	2 to 4	11.4
	SB-308	S-4	4 to 6	0.0979
	SB-407	S-5	6 to 8	26.70
	W10-TP2-S1	S1	6 to 7	10.60
	W10-TP5-S1	S1	6 to 7	<0.05
	W18-TP1-S1*	S1	6 to 8	3.00

TABLE 7

File No. 19274.08

3/7/2012

Upland Soil PCB Concentrations within West PCB Area and  
Calculation of Post Remediation Area Weight Averages

Page 3 of 4

	Sample Location	Sample ID:	Depth (ft)	Total PCBs
To Remain in Unremediated Portions of the West PCB Area within 3 feet BGS	GSS-106		0 to 0.7	2.60
	GSS-205**		surficial	3.50
	GSS-206**		surficial	0.74
	GSS-207		surficial	4.90
	GSS-208		surficial	8.40
	G-SS4		surficial	0.02
	SB-101	S-1	0 to 1	0.745
	SB-201	S-1	0 to 1	2.16
	SB-301	S-1	0 to 1	0.567
	SB-302	S-1	0 to 1	8.09
	SB-401	S-1	0 to 1	0.519
	SB-501	S-1	0 to 1	0.571
	SB-508	S-1	0 to 1	0.79
	SB-601	S-1	0 to 1	1.66
	SS - 301		surficial	0.55
	SS - 302		surficial	0.94
	SB-102	S-1	0 to 1	3.6
	SS-CP-1**		0 to 0.2	0.08
	GSS-209		0.1 to 0.5	0.39
	GSS-210		0.1 to 0.8	<0.025
	SB-102	S-2	1 to 2	<0.0535
	SB-601	S-2	1 to 2	0.603
	G-TP6-S2	S-2	2 to 3.5	0.32
	SB-201	S-3	2 to 4	<0.0543
	SB-302	S-3	2 to 4	<0.0568
	SB-501	S-3	2 to 4	<0.0680
	SB-508	S-3	2 to 4	<0.0535
To Remain in West PCB Area at Depths Greater than 3 Feet BGS	GSS-107D		3.5	16.00
	SB-504	S-4	4 to 6	0.515
	G-TP7-S2	S-2	6	0.09
	SB-503	S-5	6 to 8	24.2
	SB-504	S-5	6 to 8	<0.0814
	SB-602	S-5	6 to 8	0.234
	SB-603	S-5	6 to 8	1.69
	G-TP4-S2	S2	7.5 to 8.5	0.21
	WGW-14	S-3A	10 to 11.5	<0.025
	WGW-14	S-3AD*	10 to 11.5	<0.025

# Area Weighted Average PCB Concentration Calculations

	Sub-Areas used to calculate Weighted Average	Size of Area		Area Weight (as a fraction) <sup>2</sup>	Post Remediation Average Concentration (mg/kg) <sup>3</sup>	Post Remediation Weighted Average Concentration (mg/kg) <sup>4</sup>
		Sq. Ft.	Acre			
Total West PCB Area		175866	4.0			
Excavation Area A (6-foot exc.)	Exc A	7034		0.04	0.0025	1.00E-04
Excavation Area B1 (1-foot exc.)		13485				
OE-2		452				
Excavation Area B2 (1-foot exc.)		961				
Excavation Area C (2-foot exc.)		4308				
Excavation Area D1 (1-foot excavation)		1817				
Excavation Area D2 (1-foot excavation)		3781				
OE-1		452				
Total Excavation Area		31386	0.7			
Total Area of Cap	Cap	43584	1.0	0.25	0.0025	6.20E-04
Area of Cap Overlap Excavation Areas		4956				
Exc Areas B1, B2, C, D1 and D2 minus cap overlap <sup>1</sup>	Exc B,C,D-Cap Overlap	19396		0.11	0.3921	0.043
Total Area to Be Remediated		70014	1.6			
Total West PCB Area Not to Be Remediated	Unremediated	105852	2.4	0.60	1.55	0.934
<b>Post Remediation Area Weight Average for West PCB Area<sup>5</sup></b>						<b>0.978</b>

## Notes:

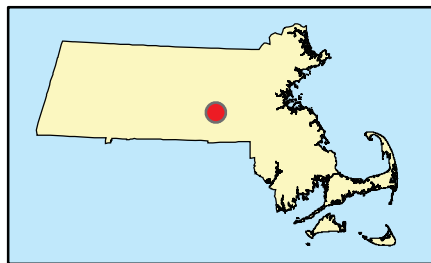
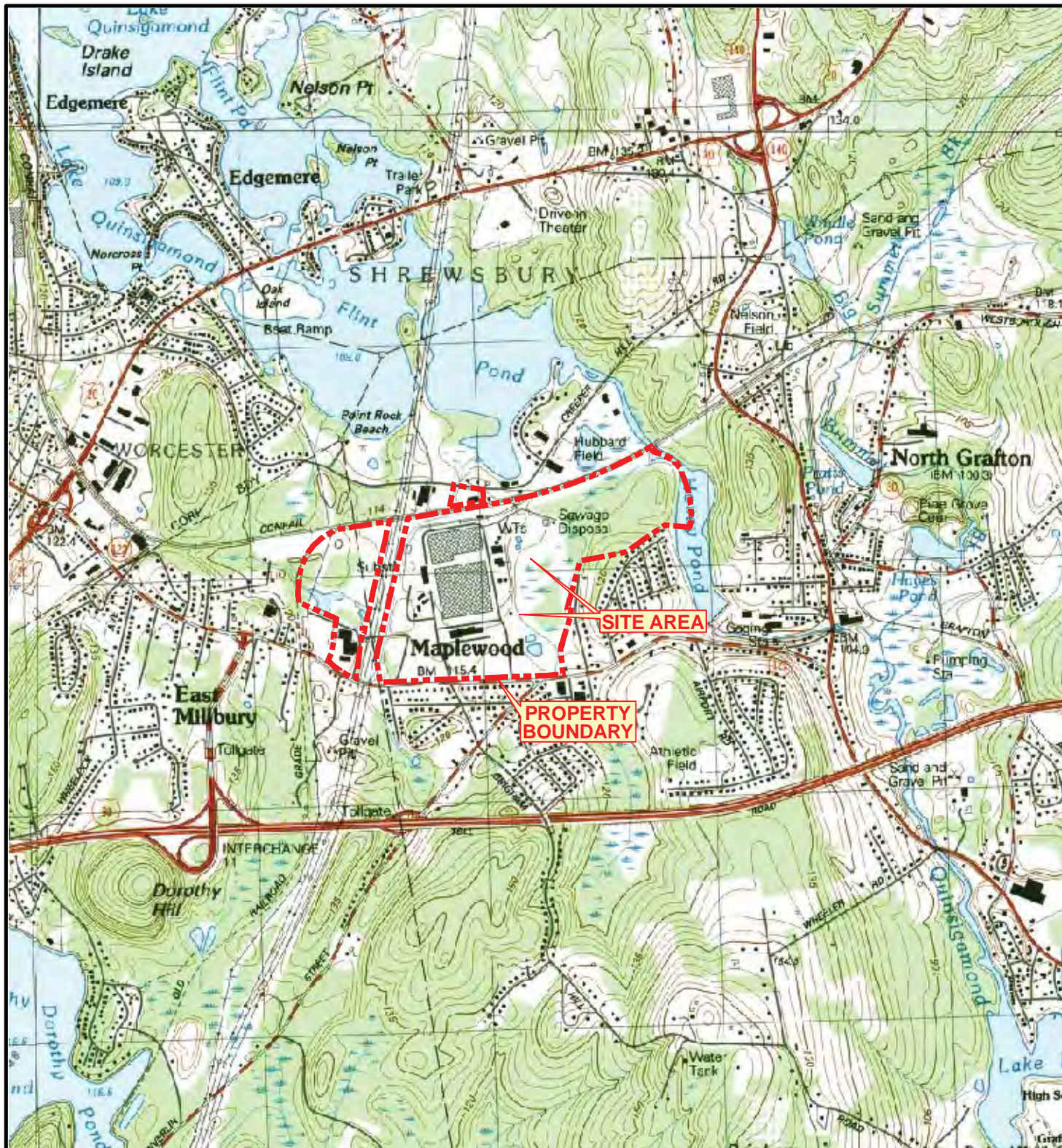
- The Post Remediation Average Concentration for Exc B,C,D - Cap Overlap was calculated as:  
Average Concentration for Samples to Remain between 1' to 3' mg/kg \* 0.666 + 0.0025 mg/kg \* 0.333
  - The Area Weight for each sub-area of interest was calculated as:  
Size of Area (sq.ft.) / total Area of West PCB Area
  - Post Remediation Average Concentrations for Exc A and the Total Cap Area were assumed to be 0.0025 (one-half the anticipated reporting limit for clean-soil analyses); for the Unremediated area the average detected concentrations for samples within 3 feet BGS was used. See note 1 above for the Exc B,C,D-Cap Overlap calculation.
  - Area weighted averages for each sub-area of interest was calculated as Area Weight \* Post Remediation Average Concentration.
  - The Post Remediation Average for the West PCB Area is the sum of the Area Weighted Averages for each sub-area of interest.
  - BGS = Below Ground Surface
- \* Indicates duplicate sample.



## **FIGURES**



J:\19,000-20,999\19274\19274-03.TLB\Figures\GIS\MXDs\19274-03\_SiteLocus-v1\_FIG-1.mxd



SOURCE : SCANNED USGS TOPOGRAPHIC QUADRANGLES  
SCANNED BY THE MASSACHUSETTS EXECUTIVE OFFICE OF  
ENVIRONMENTAL AFFAIRS, MASSGIS. DISTRIBUTED JUNE, 2001.

Data Supplied by :



0 1,000 2,000 4,000 6,000 Feet



PROJ. MGR.: MS  
DESIGNED BY: MS  
REVIEWED BY: GWM  
OPERATOR: GAS/EMD

DATE: 08-19-2009

## USGS LOCUS MAP

WYMAN GORDON  
NORTH GRAFTON, MASSACHUSETTS

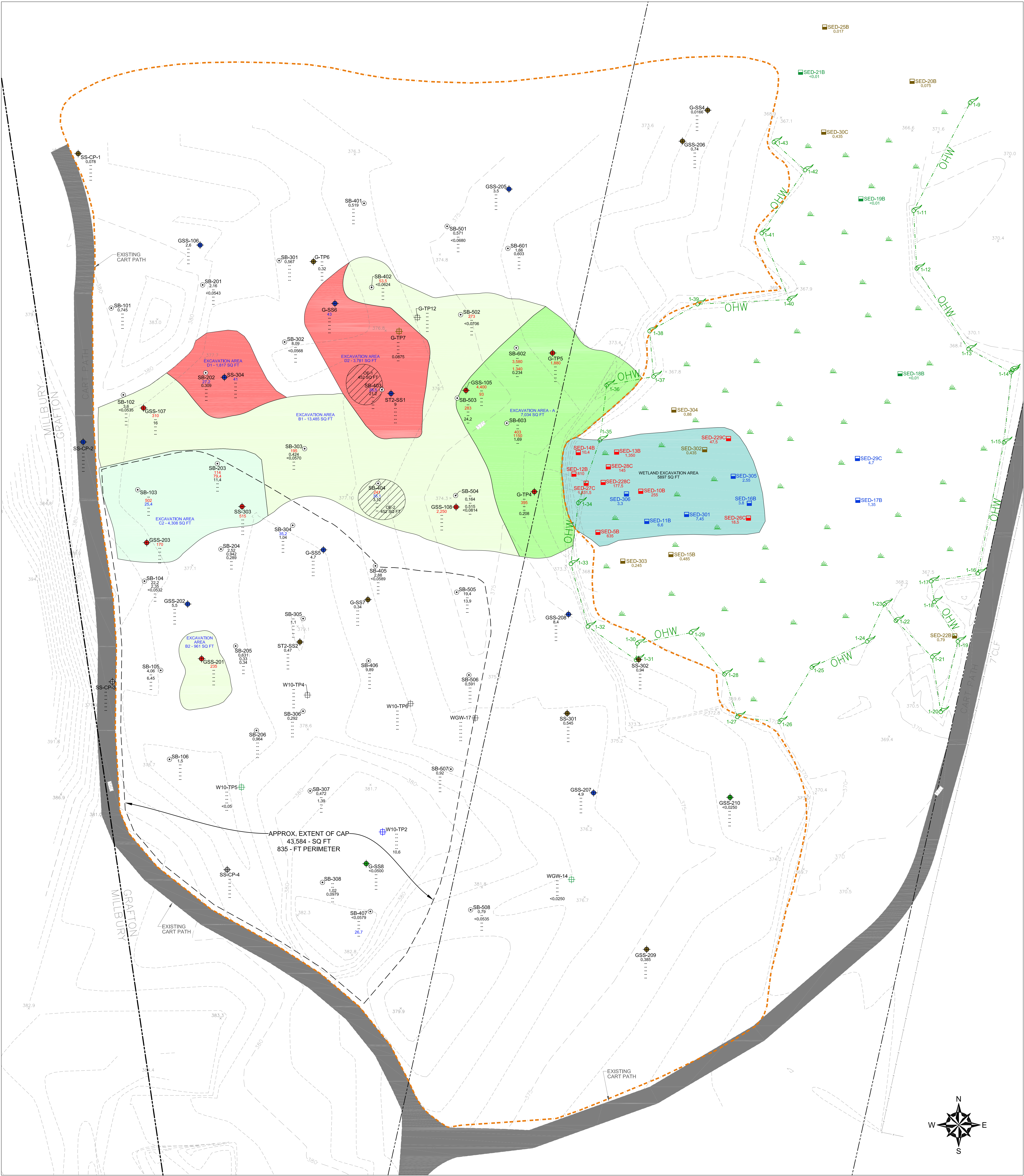
JOB NO.  
01.0019274.03

FIGURE NO.  
1









LEGEND

- GEOPROBE SOIL BORINGS PERFORMED NOVEMBER, 2011 FOR SUPPLEMENTAL INVESTIGATION
- APPROXIMATE EXTENT OF 1 FOOT EXCAVATION TO REMOVE PCBs  $\leq$  50PPM
- APPROXIMATE EXTENT OF 2 FEET OF EXCAVATION TO REMOVE PCBs  $\leq$  50PPM
- APPROXIMATE EXTENT OF 3 FEET OF EXCAVATION TO REMOVE PCBs  $\leq$  50PPM
- APPROXIMATE LOCATION OF EXTENT 1 FOOT EXCAVATION TO REMOVE 25PPM  $\leq$  PCBs  $\leq$  50PPM MATERIAL TO BE CONSOLIDATED UNDER CAP
- APPROXIMATE EXTENT OF 2.5 FEET OF EXCAVATION OF WETLAND TO REMOVE PCBs  $\leq$  9.5mg/kg
- WEST PCB AREA BOUNDARY
- PROPERTY LINE
- INDICATES TOWN BOUNDARY
- INDICATES MAJOR TOPO CONTOURS
- INDICATES MINOR TOPO CONTOURS
- LIMITS OF BORDERING VEGETATED WETLAND AS FLAGGED BY BSC GROUP MARCH 2007
- TARGETED AREAS WHICH WILL BE EXCAVATED 1-FOOT DEEPER (RELATIVE TO THE PLANNED EXCAVATION DEPTH IN THE SURROUNDING AREA) TO ACHIEVE A CLEAN-UP GOAL

UPLAND SOIL SAMPLES

- SURFICIAL SOIL SAMPLES (GENERALLY 0'-6") COLLECTED DURING MCP PHASE II AND PHASE III FIELD EFFORTS. SUB-SURFACE SAMPLES (3.5 FT DEEP) WERE COLLECTED AT GSS-105 AND GSS-107.
- PCBs  $>$  50mg/kg
  - 50mg/kg  $>$  PCBs  $>$  1.0mg/kg
  - PCBs  $<$  1.0mg/kg
  - PCBs NOT DETECTED
  - PCBs NOT ANALYZED
- SUBSURFACE SOIL SAMPLES ( $>$ 3 FEET) COLLECTED DURING TEST PIT EXCAVATION OR SOIL BORING ADVANCEMENT DURING MCP PHASE II FIELD EFFORTS.
- 50mg/kg  $>$  PCBs  $>$  1.0mg/kg
  - PCBs  $<$  1.0mg/kg
  - PCBs NOT DETECTED
  - PCBs NOT ANALYZED

ANALYTICAL UPLAND SOIL SAMPLES DEPTH BELOW GROUND SURFACE

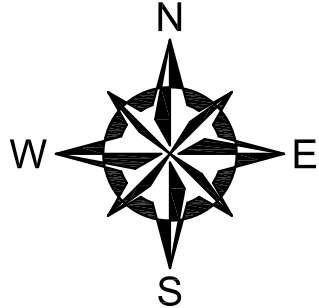
- IDENTIFICATION DATA
- PCBs  $<$  25 PPM ARE INDICATED WITH BLACK
  - 25  $<$  PCBs  $<$  50 PPM PPM ARE INDICATED WITH BLUE
  - PCBs  $>$  50 PPM ARE INDICATED WITH RED
  - HYPHENS (-) INDICATE PCBs NOT ANALYZED
- DEPTH INTERVAL
- 0 TO 1' - 25
  - 1 TO 2' - 25
  - 2 TO 4' - 25
  - 4 TO 6' - 25
  - 6 TO 8' - 25
  - 8 TO 10' - 25

WETLAND SOIL / SEDIMENT SAMPLES

- PCBs  $>$  9.5 mg/kg
- 1.0 mg/kg  $<$  PCBs  $\leq$  9.5 mg/kg
- PCBs  $\leq$  1.0mg/kg
- PCBs NOT DETECTED

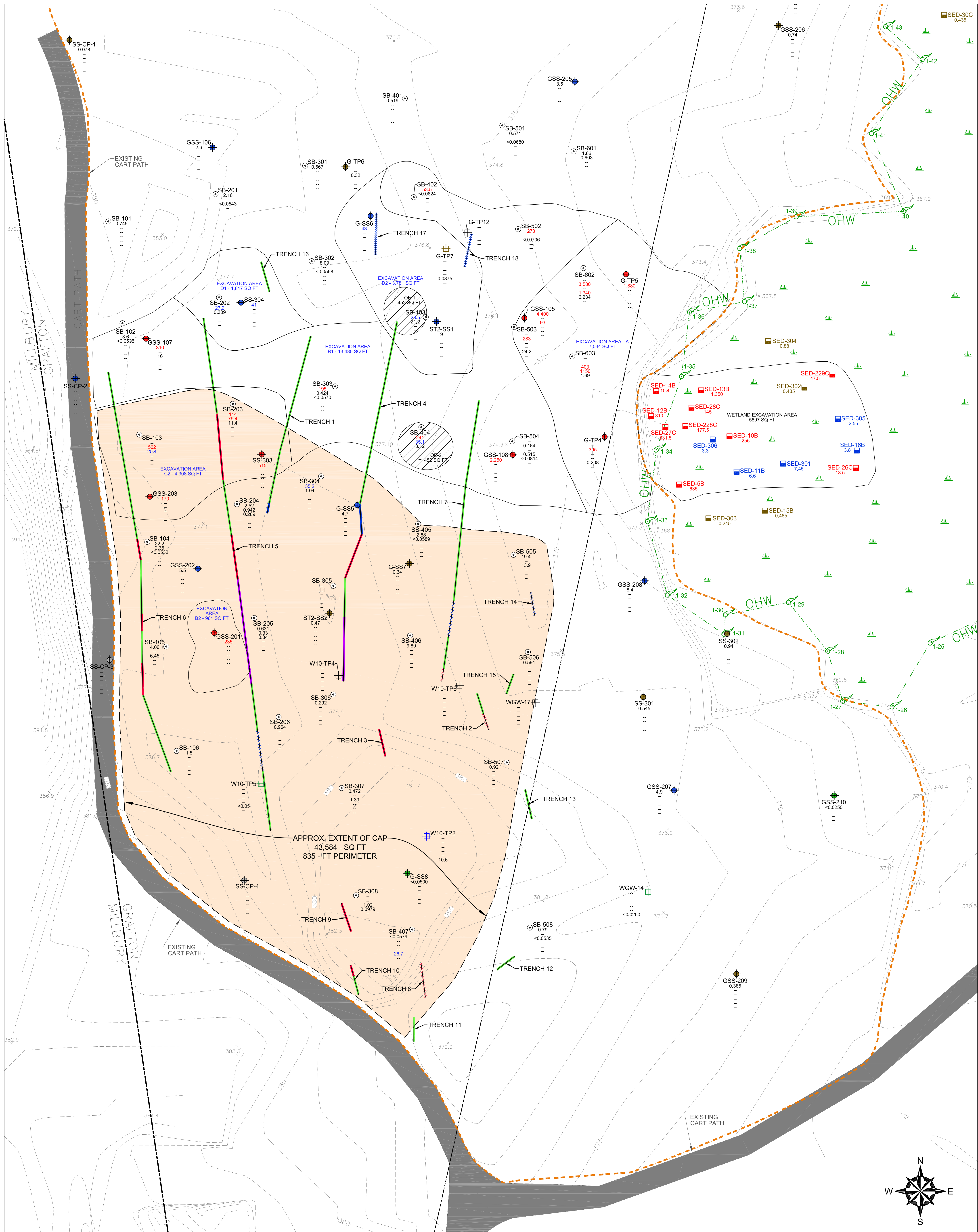
SOURCE:

- THIS PLAN WAS PREPARED FROM AN ACTUAL ON-THE-GROUND SURVEY PERFORMED BY BSC GROUP, INC. BETWEEN FEBRUARY 25, 2008 AND MARCH 21, 2008.
- THE PROPERTY LINES SHOWN ARE TAKEN FROM PLANS, DEEDS AND CERTIFICATES OF RECORD AND ARE BASED ON THE ABOVE MENTIONED FIELD SURVEY.
- THE WETLAND RESOURCE AREAS SHOWN WERE DELINEATED BY BSC GROUP, INC. DURING THE ABOVE MENTIONED FIELD SURVEY.
- ELEVATIONS SHOWN ARE BASED ON GPS OBSERVATIONS MADE DURING THE ABOVE MENTIONED SURVEY AND ARE ON NAVD (NORTH AMERICA VERTICAL DATUM) 1988.
- THE SURVEYED SITES SHOWN HEREON ARE LOCATED IN FLOOD HAZARD ZONE X. AREAS OF MINIMAL FLOODING, AS SHOWN ON FLOOD INSURANCE RATE MAP 250318 0002C IN MILLBURY AND MAP 250306 0001D IN GRAFTON.
- ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE ONLY. SEE CHAPTER 37 ACTS OF 1963, MASSACHUSETTS GENERAL LAWS. WE ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN. BEFORE PLANNING FUTURE CONNECTIONS, THE APPROPRIATE PUBLIC UTILITY ENGINEERING DEPARTMENT MUST BE CONSULTED.



NO.		ISSUE/DESCRIPTION	BY	DATE
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSMITTED, REPRODUCED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.				
WYMAN GORDON WESTSIDE NORTH GRAFTON, MASSACHUSETTS				
PROPOSED UPLAND WETLAND EXCAVATION PROPOSED REMEDIATION WEST PCB AREA				
PREPARED BY:		GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED BY:
PROJ MGR:		TLB	REVIEWED BY:	OWM
DESIGNED BY:		DCB	DRAWN BY:	MYTJURCJEM
DATE:		03-29-2012	PROJECT NO:	01.0019274.08
			CHECKED BY:	TLB
			SCALE:	1 INCH = 20 FEET
			REVISION NO.	
				FIGURE
				3





LEGEND

- GEOPROBE SOIL BORINGS
- APPROXIMATE AXIS OF OBSERVATION TRENCH
- PROPERTY LINE
- INDICATES TOWN BOUNDARY
- INDICATES MAJOR TOPO CONTOURS
- INDICATES MINOR TOPO CONTOURS
- LIMITS OF BORDERING VEGETATED WETLAND AS FLAGGED BY BSC GROUP MARCH 2007
- TARGETED AREAS WHICH WILL BE EXCAVATED 1-FOOT DEEPER (RELATIVE TO THE PLANNED EXCAVATION DEPTH IN THE SURROUNDING AREA) TO ACHIEVE A CLEAN-UP GOAL.

OBSERVATION MADE REGARDING VISIBLE WASTE DURING TEST PIT PROGRAM FROM OCTOBER 24 TO 25 2011

- NO WASTE OBSERVED
- SALT WASTE (DISCRETE LAYER)
- SALT WASTE (PATCHY)
- ACID WASTE (DISCRETE LAYER)
- ACID WASTE (PATCHY)
- ACID WASTE AND SALT WASTE (PATCHY)

UPLAND SOIL SAMPLES

SURFICIAL SOIL SAMPLES (GENERALLY 0"-6") COLLECTED DURING MCP PHASE II AND PHASE III FIELD EFFORTS. SUB-SURFACE SAMPLES (3.5 FT DEEP) WERE COLLECTED AT GSS-105 AND GSS-107.

- PCBs > 50mg/kg
- 50mg/kg > PCBs > 1.0mg/kg
- PCBs < 1.0mg/kg
- PCBs NOT DETECTED
- PCBs NOT ANALYZED

ANALYTICAL UPLAND SOIL SAMPLES DEPTH BELOW GROUND SURFACE

- IDENTIFICATION DATA
- PCBs < 25 PPM ARE INDICATED WITH BLACK
- 25 < PCBs < 50 PPM PPM ARE INDICATED WITH BLUE
- PCBs > 50 PPM ARE INDICATED WITH RED
- HYPHENS (-) INDICATE PCBs NOT ANALYZED

SUBSURFACE SOIL SAMPLES (3-3 FEET) COLLECTED DURING TEST PIT EXCAVATION OR SOIL BORING ADVANCEMENT, DURING MCP PHASE II FIELD EFFORTS.

- 50mg/kg > PCBs > 1.0mg/kg
- PCBs < 1.0mg/kg
- PCBs NOT DETECTED
- PCBs NOT ANALYZED

WETLAND SOIL / SEDIMENT SAMPLES

- PCBs > 9.5 mg/kg
- 1.0 mg/kg < PCBs ≤ 9.5 mg/kg
- PCBs ≤ 1.0mg/kg
- PCBs NOT DETECTED

NOTE:

APPROXIMATELY 43,584 SQUARE FEET TO BE COVERED BY A COMPACTED, LOW PERMEABILITY SOIL CAP. OVERLAIN BY A LAYER OF COMMON GRANULAR FILL, WHICH IN TURN WILL BE OVERLAIN BY HIGH ORGANIC CONTENT, MANUFACTURED TOPSOIL. THIS AREA WILL BE SEED WITH A CONSERVATION SEED MIX AND WILL BE MOWN (VIA BRUSH-HOG OR EQUIVALENT) AT LEAST EVERY THREE YEARS TO PREVENT THE ESTABLISHMENT OF TREES OR SHRUBS CAPABLE OF COMPROMISING THE INTEGRITY OF THE SOIL CAP. NOTE THAT, OWING TO SOME UNCERTAINTY REGARDING THE LOCATION OF SUBSURFACE DISPOSAL PITS, THE PROPOSED CAP LAYOUT WAS CONSERVATIVELY EXPANDED TO ENSURE COVERAGE OF THE PIT.

THE MANUFACTURED TOPSOIL LAYER SHALL MEET THE FOLLOWING SPECIFICATIONS:

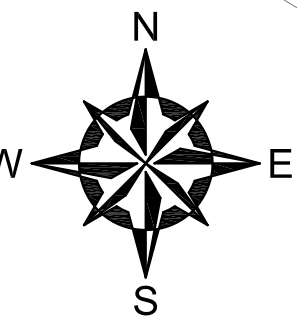
- ACHIEVE A FINAL (IN PLACE) THICKNESS OF AT LEAST 6 INCHES.
- ACHIEVE A PERMEABILITY OF 1 X 10<sup>-7</sup> CM/SEC OR LESS.
- CONSTRUCTED OF MINERAL SOILS WITH 30% OR GREATER, BY WEIGHT, PASSING A NO. 200 SIEVE.
- EXHIBIT A LIQUID LIMIT GREATER THAN 30.
- EXHIBIT A PLASTICITY INDEX OF GREATER THAN 15.

THE MANUFACTURED TOPSOIL LAYER SHALL MEET THE FOLLOWING SPECIFICATIONS:

- ACHIEVE A FINAL (IN PLACE) THICKNESS OF AT LEAST 6 INCHES.
- CONTAIN AN ORGANIC CARBON CONTENT OF BETWEEN 10 AND 15 PERCENT.

SOURCE:

- THIS PLAN WAS PREPARED FROM AN ACTUAL ON-THE-GROUND SURVEY PERFORMED BY BSC GROUP, INC. BETWEEN FEBRUARY 25, 2008 AND MARCH 21, 2008.
- THE PROPERTY LINES SHOWN ARE TAKEN FROM PLANS, DEEDS AND CERTIFICATES OF RECORD AND ARE BASED ON THE ABOVE MENTIONED FIELD SURVEY.
- THE WETLAND RESOURCE AREAS SHOWN WERE DELINEATED BY BSC GROUP, INC. DURING THE ABOVE MENTIONED FIELD SURVEY.
- ELEVATIONS SHOWN ARE BASED ON GPS OBSERVATIONS MADE DURING THE FOREMENTIONED SURVEY AND ARE ON NAVD (NORTH AMERICA VERTICAL DATUM) 1988.
- THE SURVEYED SITES SHOWN HEREON ARE LOCATED IN FLOOD HAZARD ZONE X, AREAS OF MINIMAL FLOODING, AS SHOWN ON FLOOD INSURANCE RATE MAP 250318 0002C IN MILLBURY AND MAP 250306 0001D IN GRAFTON.
- ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE ONLY. SEE CHAPTER 37 ACTS OF 1963, MASSACHUSETTS GENERAL LAWS. WE ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCUATELY SHOWN. BEFORE PLANNING FUTURE CONNECTIONS, THE APPROPRIATE PUBLIC UTILITY ENGINEERING DEPARTMENT MUST BE CONSULTED.



0 10' 20' 40' 60'  
SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE
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WYMAN GORDON WESTSIDE NORTH GRAFTON, MASSACHUSETTS			
PROPOSED CAP AREA PROPOSED REMEDIATION WEST PCB AREA			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: WYMAN GORDON A PCC Company	
PROJ MGR: TLB	REVIEWED BY: GWM	CHECKED BY: TLB	FIGURE
DESIGNED BY: DCB	DRAWN BY: MVT/JRM/CMC	SCALE: 1 INCH = 20 FEET	4
DATE: 03-29-2012	PROJECT NO: 01.0019274.08	REVISION NO:	





## **APPENDIX A**

### **LIMITATIONS**

## MASSACHUSETTS CONTINGENCY PLAN STUDIES LIMITATIONS

1. GZA's study was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area, and GZA observed that degree of care and skill generally exercised by other consultants under similar circumstances and conditions. GZA's findings and conclusions must be considered not as scientific certainties, but rather as our professional opinion concerning the significance of the limited data gathered during the course of the study. No other warranty, express or implied is made. Specifically, GZA does not and cannot represent that the Site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its study. Additionally, GZA makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a Massachusetts Department of Environmental Protection (DEP) audit.
2. This study and report have been prepared on behalf of and for the exclusive use of Wyman-Gordon Company solely for use in an environmental evaluation of the North Grafton and Millbury properties ("Site") under the Massachusetts Contingency Plan (MCP - 310 CMR 40.0000). This report and the findings contained herein shall not, in whole or in part, be disseminated or conveyed to any other party, nor used by any other party in whole or in part, without the prior written consent of GZA. However, GZA acknowledges and agrees that the report may be conveyed to the DEP in support of a Response Action Outcome for the Site.
3. The observations described in this report were made under the conditions stated therein. The conclusions presented in the report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by Client. The work described in this report was carried out in accordance with the Terms and Conditions referenced in our standing agreement with Wyman-Gordon Company.
4. In preparing this report, GZA GeoEnvironmental, Inc. (GZA) has relied on certain information provided by state and local officials and other parties referenced therein, and on information contained in the files of state and/or local agencies available to GZA at the time of the study. Although there may have been some degree of overlap in the information provided by these various sources, GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.
5. In the event that the Client or others authorized to use this report obtain information on environmental or hazardous waste issues at the Site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.

6. Observations were made of the Site and of structures on the Site as indicated within the report. Where access to portions of the Site or to structures on the Site was unavailable or limited, GZA renders no opinion as to the presence of hazardous material or oil, or to the presence of indirect evidence relating to hazardous material or oil, in that portion of the Site or structure. In addition, GZA renders no opinion as to the presence of hazardous material or oil, or to the presence of indirect evidence relating to hazardous material or oil, where direct observation of the interior walls, floor, or ceiling of a structure on a Site was obstructed by objects or coverings on or over these surfaces.
7. Unless otherwise specified in the report, GZA did not perform testing or analyses to determine the presence or concentration of asbestos or polychlorinated biphenyls (PCBs) at the Site or in the environment at the Site.
8. The purpose of this report was to assess the Site with respect to the requirements of the MCP. No specific attempt was made to check on the compliance of present or past owners or operators of the Site with federal, state, or local laws and regulations, environmental or otherwise.
9. The conclusions and recommendations contained in this report are based in part upon the data obtained from a limited number of soil, soil gas, and/or groundwater samples obtained from widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until further exploration. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the conclusions and recommendations of this report.
10. Water level readings have been made in the test pits, borings, and/or observation wells at the times and under the conditions stated in the text or on the exploration logs. However, it must be noted that fluctuations in the level of groundwater may occur due to variations in rainfall and other factors different from those prevailing at the time measurements were made.
11. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the boring logs.
12. Where quantitative laboratory analyses have been conducted by an outside laboratory, GZA has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these data.
13. The conclusions and recommendations contained in this report are based in part upon various types of chemical data and are contingent upon their validity. These data have been reviewed and interpretations made in the report. As may be indicated within the report, some of these data may be preliminary "screening" level data, and should be confirmed with quantitative analyses if more specific information is necessary. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their flow

paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors. Should additional chemical data become available in the future, these data should be reviewed by GZA and the conclusions and recommendations presented herein modified accordingly.

14. Chemical analyses have been performed for specific parameters during the course of this Site assessment, as described in the text. However, it should be noted that additional chemical constituents not searched for during the current study may be present at the Site.
15. GZA's risk evaluation was performed in accordance with generally accepted practices of the Massachusetts Department of Environmental Protection and other consultants undertaking similar studies. The findings of the risk evaluation are dependent on numerous assumptions and uncertainties inherent in the risk assessment process. Sources of uncertainty may include the description of Site conditions and the nature and extent of chemical distribution and the use of toxicity information. Consequently, the findings of the risk assessment are not an absolute characterization of actual risks, but rather serve to highlight potential sources of risk at the Site. Although the range of uncertainties has not been quantified, the use of conservative assumptions and parameters throughout the assessment would be expected to err on the side of protection of human health and the environment.
16. This report may contain approximate cost estimates for purposes of evaluating alternative remedial programs. These estimates involve approximate quantity evaluations. A preliminary estimate of this nature is likely to vary substantially from Contractors' Bid Prices and is not to be considered the equivalent of nor as reliable as Contractors' Bid Prices. Prices for similar work undertaken in the future will be subject to general and sometimes erratic price increases. The costs of future environmental, technical, and engineering services which may be required to implement any corrective action or remediation or installation of any systems cannot be accurately estimated.
17. It is recommended that GZA be retained to provide further engineering services during construction and/or implementation of any remedial measures recommended in this report. This is to allow GZA to observe compliance with the concepts and recommendations contained herein, and to allow the development of design changes in the event that subsurface conditions differ from those anticipated.





## **APPENDIX B**

### **SOIL AND SEDIMENT LAB REPORTS**

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0103-00118

Sample ID: WGW-14 S-3A  
 Sample Date: 3/20/2001

Sample No.: 002

Test Performed	Method	Results	Units	Tech	Analysis Date
Chlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,1,1,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	3/23/01
Ethylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
m&p-Xylene	EPA 8260	< 100	ug/kg	NCS	3/23/01
o-Xylene	EPA 8260	< 100	ug/kg	NCS	3/23/01
Styrene	EPA 8260	< 100	ug/kg	NCS	3/23/01
Bromoform	EPA 8260	< 200	ug/kg	NCS	3/23/01
Isopropylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,2,3-Trichloropropane	EPA 8260	< 100	ug/kg	NCS	3/23/01
Bromobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
n-Propylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
2-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,3,5-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
4-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	3/23/01
tert-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,2,4-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
sec-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
p-Isopropyltoluene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,3-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,4-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
n-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,2-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 500	ug/kg	NCS	3/23/01
1,2,4-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
Hexachlorobutadiene	EPA 8260	< 100	ug/kg	NCS	3/23/01
Naphthalene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,2,3-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
Surrogates:	EPA 8260				
***1,2-Dichloroethane-D4	EPA 8260	95.8	% R	NCS	3/23/01
***Toluene-D8	EPA 8260	93.5	% R	NCS	3/23/01
***4-Bromofluorobenzene	EPA 8260	97.9	% R	NCS	3/23/01
Preparation		20	DF	NCS	3/23/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	3/26/01
Aroclor 1262	EPA 8082	< 25	ug/kg	RJD	3/26/01
Aroclor 1260	EPA 8082	< 25	ug/kg	RJD	3/26/01
Aroclor 1254	EPA 8082	< 25	ug/kg	RJD	3/26/01
Aroclor 1248	EPA 8082	< 25	ug/kg	RJD	3/26/01
Aroclor 1242/1016	EPA 8082	< 25	ug/kg	RJD	3/26/01
Aroclor 1232	EPA 8082	< 25	ug/kg	RJD	3/26/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0103-00118

Sample ID: WGW-14 S-3A  
Sample Date: 3/20/2001

Sample No.: 002

Test Performed	Method	Results	Units	Tech	Analysis Date
Aroclor 1221	EPA 8082	< 25	ug/kg	RJD	3/26/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	101	% R	RJD	3/26/01
***Decachlorobiphenyl	EPA 8082	103	% R	RJD	3/26/01
Extraction		1.0	DF	RJD	3/26/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	3/29/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	< 2.0	mg/kg	OMS	3/29/01
C9-C18 Aliphatic Fraction	MADEP	< 2.0	mg/kg	OMS	3/29/01
C19-C36 Aliphatic Fraction	MADEP	< 2.0	mg/kg	OMS	3/29/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	< 2.0	mg/kg	OMS	3/29/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116 %R	MADEP	104	%R	OMS	3/29/01
***p-Terphenyl (aromatic): 50-135 %R	MADEP	83.4	%R	OMS	3/29/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	3/29/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	3/29/01
Acenaphthylene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	3/29/01
Acenaphthene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	3/29/01
Fluorene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Phenanthrene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	3/29/01
Anthracene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Fluoranthene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Pyrene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Benzo [a] Anthracene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Chrysene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Benzo [b] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Benzo [k] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Benzo [a] Pyrene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Dibenzo [a,h] Anthracene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Benzo [g,h,i] Perylene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Extraction	SONICATION	1.0	DF	AHW	3/26/01
Sample information can be found on the COC.					
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	9540	mg/Kg	BJP	4/04/01
Barium	EPA 6010	23.1	mg/Kg	BJP	4/04/01
Magnesium	EPA 6010	4080	mg/Kg	BJP	4/04/01
PRIORITY POLLUTANT METALS				BJP	4/04/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0103-00118

Sample ID: WGW-14 S-3AD  
Sample Date: 3/20/2001

Sample No.: 003

Test Performed	Method	Results	Units	Tech	Analysis Date
Chlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,1,1,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	3/23/01
Ethylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
m&p-Xylene	EPA 8260	< 100	ug/kg	NCS	3/23/01
o-Xylene	EPA 8260	< 100	ug/kg	NCS	3/23/01
Styrene	EPA 8260	< 100	ug/kg	NCS	3/23/01
Bromoform	EPA 8260	< 200	ug/kg	NCS	3/23/01
Isopropylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,2,3-Trichloropropane	EPA 8260	< 100	ug/kg	NCS	3/23/01
Bromobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
n-Propylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
2-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,3,5-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
4-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	3/23/01
tert-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,2,4-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
sec-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
p-Isopropyltoluene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,3-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,4-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
n-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,2-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 500	ug/kg	NCS	3/23/01
1,2,4-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
Hexachlorobutadiene	EPA 8260	< 100	ug/kg	NCS	3/23/01
Naphthalene	EPA 8260	< 100	ug/kg	NCS	3/23/01
1,2,3-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	3/23/01
Surrogates:	EPA 8260				
***1,2-Dichloroethane-D4	EPA 8260	100	% R	NCS	3/23/01
***Toluene-D8	EPA 8260	94.6	% R	NCS	3/23/01
***4-Bromofluorobenzene	EPA 8260	100	% R	NCS	3/23/01
Preparation		20	DF	NCS	3/23/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	3/26/01
Aroclor 1262	EPA 8082	< 25	ug/kg	RJD	3/26/01
Aroclor 1260	EPA 8082	< 25	ug/kg	RJD	3/26/01
Aroclor 1254	EPA 8082	< 25	ug/kg	RJD	3/26/01
Aroclor 1248	EPA 8082	< 25	ug/kg	RJD	3/26/01
Aroclor 1242/1016	EPA 8082	< 25	ug/kg	RJD	3/26/01
Aroclor 1232	EPA 8082	< 25	ug/kg	RJD	3/26/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0103-00118

Sample ID: WGW-14 S-3AD  
 Sample Date: 3/20/2001

Sample No.: 003

Test Performed	Method	Results	Units	Tech	Analysis Date
Aroclor 1221	EPA 8082	< 25	ug/kg	RJD	3/26/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	100	% R	RJD	3/26/01
***Decachlorobiphenyl	EPA 8082	103	% R	RJD	3/26/01
Extraction		1.0	DF	RJD	3/26/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	3/29/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	< 2.0	mg/kg	OMS	3/29/01
C9-C18 Aliphatic Fraction	MADEP	< 2.0	mg/kg	OMS	3/29/01
C19-C36 Aliphatic Fraction	MADEP	< 2.0	mg/kg	OMS	3/29/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	< 2.0	mg/kg	OMS	3/29/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116% R	MADEP	115	%R	OMS	3/29/01
***p-Terphenyl (aromatic): 50-135% R	MADEP	96.5	%R	OMS	3/29/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	3/29/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	3/29/01
Acenaphthylene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	3/29/01
Acenaphthene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	3/29/01
Fluorene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Phenanthrene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	3/29/01
Anthracene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Fluoranthene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Pyrene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Benzo [a] Anthracene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Chrysene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Benzo [b] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Benzo [k] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Benzo [a] Pyrene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Dibenzo [a,h] Anthracene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Benzo [g,h,i] Perylene	MADEP	< 0.30	mg/kg	OMS	3/29/01
Extraction	SONICATION	1.0	DF	AHW	3/26/01
Sample information can be found on the COC.					
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	12500	mg/Kg	BJP	4/04/01
Barium	EPA 6010	19.7	mg/Kg	BJP	4/04/01
Magnesium	EPA 6010	4290	mg/Kg	BJP	4/04/01
PRIORITY POLLUTANT METALS				BJP	4/04/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0103-00118

## PROJECT NARRATIVE:

## 1. Sample Receipt

The samples were received on 03/21/01 via   x   GZA courier,    EC,    FEDEX, or    hand delivered.

The temperature of the    temperature blank,   x   cooler air was 8.6 degrees C. No cooling materials were present. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference, including methanol preservation of soil samples for volatile analyses (preparation method 5035).

## 2. EPA Method 8260

Attach QC 8260 03/23/01 - S

## 3. EPA Method 8082

Attach QC 8082 03/26/01 - Solid

## 4. MADEP EPH

Attach QC EPH 03/26/01 - Solid

MA DEP EPH Method Statement:

The containers were:   X   Satisfactory,    Broken,    Leaking.

Were all QA/QC procedures required by the EPH Method followed?

Yes   X   No   

Were all performance/acceptance standards for the required QA/QC procedures achieved? Yes   X   No   

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes   X   No   

As required by the method, the following statements apply;

1. The solvent extraction methods utilized have been demonstrated to achieve the required performance levels through the initial demonstration of capabilities study.

2. Baseline blank correction is routinely performed.

GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0103-00118

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3. The C11-C22 aromatic range is corrected for the 17 target polynuclear aromatic hydrocarbons (PAHs).

4. The reported surrogates are also the fractionation surrogates.

The signature of the report indicates the following attestation (as required by the MA DEP Method);

I attest under the pains and penalties of perjury, that based upon inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is to the best of my knowledge and belief, accurate and complete.

Data Authorized By: 

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Soil data is reported on a dry weight basis unless otherwise specified.

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.

Laboratory Identification Numbers:

MA: MA092      NH: 2028  
CT: PH0579  
NY: 11063      RI: A46

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02464  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

DATE: 3/23/01 S

**AQUEOUS**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		65-127		20
Trichloroethene		87-105		20
Toluene		86-105		20

**SOLID**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	98.3	70-130	2.89	35
Trichloroethene	99.8	70-130	0.84	35
Toluene	105	70-130	1.67	35

**METHOD BLANK**

TOTAL COMPOUNDS DETECTED	ND
--------------------------	----

SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4		80-114	104	80-120
Toluene-D8		88-110	95.7	81-117
4-Bromofluorobenzene		86-115	100	80-120



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 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
 QUALITY CONTROL SOLID

METHOD BLANK

DATE EXTRACTED: 03/26/01

DATE ANALYZED: 03/26/01

8082 COMPOUNDS POLYCHLORINATED BIPHENYLS	CONC. ug/L-PPB	QUANT. LIMIT ug/L-PPB
AROCLOR 1262	ND	5.0
AROCLOR 1260	ND	5.0
AROCLOR 1254	ND	5.0
AROCLOR 1248	ND	5.0
AROCLOR 1242/1016	ND	5.0
AROCLOR 1232	ND	10
AROCLOR 1221	ND	5.0

8082 SURROGATES	% RECOVERY	RECOV. LIMITS
TETRACHLORO-M-XYLENE	86.5	45-147
DECACHLOROBIPHENYL	109	27-138

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
Aroclor 1242	139	40-140	9.81	50

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 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748 (508) 435-9244  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH**  
**EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 03/26/2001      Solid

METHOD BLANK	AQUEOUS ug/L-PPB	SOLID mg/kg · PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 ALIPHATICS	<50	<1.0
C19-C36 ALIPHATICS	<50	<1.0
C10-C22 AROMATICS	<100	<2.0
TOTAL UNWEIGHTED CONC.	<50	<1.0
<b>WEIGHTED CONC.</b>		
C9-C18 ALIPHATICS (0.05 MULT.)	<2.5	<0.05
C19-C36 ALIPHATICS (0.005 MULT.)	<0.25	<0.005
C10-C22 AROMATICS (1.0 MULT.)	<100	<2.0
TOTAL WEIGHTED CONC.	<0.25	<0.005
<b>TARGET COMPOUNDS</b>		
NAPHTHALENE	<10	<0.30
2-METHYLNAPHTHALENE	<10	<0.30
1-METHYLNAPHTHALENE	<10	<0.30
ACENAPHTHYLENE	<10	<0.30
ACENAPHTHENE	<10	<0.30
FLUORENE	<10	<0.30
PHENANTHRENE	<10	<0.30
ANTHRACENE	<10	<0.30
FLUORANTHENE	<10	<0.30
PYRENE	<10	<0.30
BENZO(a)ANTHRACENE	<10	<0.30
CHRYSENE	<10	<0.30
BENZO(b)FLUORANTHENE	<10	<0.30
BENZO(k)FLUORANTHENE	<10	<0.30
BENZO(a)PYRENE	<10	<0.30
INDENO(1,2,3-cd)PYRENE	<10	<0.30
DIBENZO(a,h)ANTHRACENE	<10	<0.30
BENZO(g,h,i)PERYLENE	<10	<0.30

SURROGATE	%RECOV.	LIMITS-AQ.	LIMITS-SOL.
***1-CHLORO-OCTADECANE (AL)	92.6	40-130	40-116
***p-TERPHENYL(AR)	70.2	50-123	50-135

MATRIX SPIKE/DUPLICATE SPIKE	RECOV.%	LIMITS-AQ.	LIMITS-SOL.
EICOSANE (AL) MS	72.4	40-130	40-116
EICOSANE (AL) MSD	71.5	40-130	40-116
EICOSANE % DIFFERENCE	1.29	35	45
FLUORANTHENE (AR) MS	64.2	50-123	50-135
FLUORANTHENE (AR) MSD	55.4	50-123	50-135
FLUORANTHENE % DIFFERENCE	14.6	35	45

## CHAIN-OF-CUSTODY RECORD

W.O. # 0103-0018  
(for lab use only)

[illegible]

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0103-00159

Sample ID: WGW-14  
 Sample Date: 3/26/2001

Sample No.: 001

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	3/28/01
Aroclor 1262	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Aroclor 1260	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Aroclor 1254	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Aroclor 1248	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Aroclor 1242/1016	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Aroclor 1232	EPA 8082	< 0.40	ug/L	RJD	3/28/01
Aroclor 1221	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	44.0	% R	RJD	3/28/01
***Decachlorobiphenyl	EPA 8082	68.6	% R	RJD	3/28/01
Extraction		1.0	DF	KJW	3/28/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/03/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	< 100	ug/L	OMS	4/03/01
C9-C18 Aliphatic Fraction	MADEP	< 100	ug/L	OMS	4/03/01
C19-C36 Aliphatic Fraction	MADEP	< 100	ug/L	OMS	4/03/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	< 100	ug/L	OMS	4/03/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-130 %R	MADEP	18.9	* %R	OMS	4/03/01
***p-Terphenyl (aromatic): 50-123 %R	MADEP	19.6	%R	OMS	4/03/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/03/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/03/01
Acenaphthylene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/03/01
Acenaphthene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/03/01
Fluorene	MADEP	< 5.0	ug/L	OMS	4/03/01
Phenanthrene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/03/01
Anthracene	MADEP	< 5.0	ug/L	OMS	4/03/01
Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/03/01
Pyrene	MADEP	< 5.0	ug/L	OMS	4/03/01
Benzo [a] Anthracene	MADEP	< 5.0	ug/L	OMS	4/03/01
Chrysene	MADEP	< 5.0	ug/L	OMS	4/03/01
Benzo [b] Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/03/01
Benzo [k] Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/03/01
Benzo [a] Pyrene	MADEP	< 5.0	ug/L	OMS	4/03/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 5.0	ug/L	OMS	4/03/01
Dibenzo [a,h] Anthracene	MADEP	< 5.0	ug/L	OMS	4/03/01
Benzo [g,h,i] Perylene	MADEP	< 5.0	ug/L	OMS	4/03/01
Extraction	SOLVENT EXT.	1.0	DF	KJW	3/29/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0103-00159

Sample ID: WGW-7  
 Sample Date: 3/26/2001

Sample No.: 004

Test Performed	Method	Results	Units	Tech	Analysis Date
1,1,1,2-Tetrachloroethane	EPA 8260	< 1.0	ug/L	NCS	3/30/01
Ethylbenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
m&p-Xylene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
o-Xylene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
Styrene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
Bromoform	EPA 8260	< 2.0	ug/L	NCS	3/30/01
Isopropylbenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 1.0	ug/L	NCS	3/30/01
1,2,3-Trichloropropane	EPA 8260	< 1.0	ug/L	NCS	3/30/01
Bromobenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
N-Propylbenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
2-Chlorotoluene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
1,3,5-Trimethylbenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
4-Chlorotoluene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
tert-Butylbenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
1,2,4-Trimethylbenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
sec-Butylbenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
p-Isopropyltoluene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
1,3-Dichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
1,4-Dichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
n-Butylbenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
1,2-Dichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 5.0	ug/L	NCS	3/30/01
1,2,4-Trichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
Hexachlorobutadiene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
Naphthalene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
1,2,3-Trichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	3/30/01
Surrogates:	EPA 8260				
***1,2-Dichloroethane-D4	EPA 8260	90.7	% R	NCS	3/30/01
***Toluene-D8	EPA 8260	93.9	% R	NCS	3/30/01
***4-Bromofluorobenzene	EPA 8260	103	% R	NCS	3/30/01
Preparation		1.0	DF	NCS	3/30/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	3/28/01
Aroclor 1262	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Aroclor 1260	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Aroclor 1254	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Aroclor 1248	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Aroclor 1242/1016	EPA 8082	< 0.20	ug/L	RJD	3/28/01
Aroclor 1232	EPA 8082	< 0.40	ug/L	RJD	3/28/01
Aroclor 1221	EPA 8082	< 0.20	ug/L	RJD	3/28/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0103-00159

Sample ID: WGW-7  
 Sample Date: 3/26/2001

Sample No.: 004

Test Performed	Method	Results	Units	Tech	Analysis Date
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	41.8	% R	RJD	3/28/01
***Decachlorobiphenyl	EPA 8082	73.4	% R	RJD	3/28/01
Extraction		1.0	DF	KJW	3/28/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/08/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	< 100	ug/L	OMS	4/08/01
C9-C18 Aliphatic Fraction	MADEP	< 100	ug/L	OMS	4/08/01
C19-C36 Aliphatic Fraction	MADEP	< 100	ug/L	OMS	4/08/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	< 100	ug/L	OMS	4/08/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-130 %R	MADEP	92.1	%R	OMS	4/08/01
***p-Terphenyl (aromatic): 50-123 %R	MADEP	69.8	%R	OMS	4/08/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/08/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/08/01
Acenaphthylene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/08/01
Acenaphthene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/08/01
Fluorene	MADEP	< 5.0	ug/L	OMS	4/08/01
Phenanthrene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/08/01
Anthracene	MADEP	< 5.0	ug/L	OMS	4/08/01
Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/08/01
Pyrene	MADEP	< 5.0	ug/L	OMS	4/08/01
Benzo [a] Anthracene	MADEP	< 5.0	ug/L	OMS	4/08/01
Chrysene	MADEP	< 5.0	ug/L	OMS	4/08/01
Benzo [b] Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/08/01
Benzo [k] Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/08/01
Benzo [a] Pyrene	MADEP	< 5.0	ug/L	OMS	4/08/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 5.0	ug/L	OMS	4/08/01
Dibenzo [a,h] Anthracene	MADEP	< 5.0	ug/L	OMS	4/08/01
Benzo [g,h,i] Perylene	MADEP	< 5.0	ug/L	OMS	4/08/01
Extraction	SOLVENT EXT.	1.0	DF	AHW	4/06/01
Sample information can be found on the COC.					
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	< 0.0860	mg/L	BJP	4/13/01
Barium	EPA 6010	0.174	mg/L	BJP	4/13/01
Magnesium	EPA 6010	61.2	mg/L	BJP	4/13/01
PRIORITY POLLUTANT METALS				BJP	4/13/01
Silver	EPA 6010	< 0.0130	mg/L	BJP	4/13/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0103-00159

## PROJECT NARRATIVE:

## 1. Sample Receipt

The samples were received on 03/27/01 via ☒ GZA courier, ☐ EC, ☐ FEDEX, or ☐ hand delivered.

The temperature of the ☐ temperature blank, ☒ cooler air was 6.5 degrees C. No cooling materials were present. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference, including methanol preservation of soil samples for volatile analyses (preparation method 5035).

## 2. EPA Method 8082

Attach QC 8082 03/28/01 - Aqueous

## 3. EPA Method 8260

Attach QC 8260 03/29/01 - S

Attach QC 8260 03/30/01 - S

## 4. MADEP EPH

The out of range surrogates in sample WGW-14 were not confirmed by re-analysis due to consumption of the entire sample during extraction.

Attach QC EPH 03/30/01 - Aqueous

Attach QC EPH 03/29/01 - Aqueous

Attach QC EPH 04/06/01 - Aqueous

MA DEP EPH Method Statement:

The containers were: ☒ Satisfactory, ☐ Broken, ☐ Leaking.

Were all QA/QC procedures required by the EPH Method followed?

Yes ☒ No ☐

Were all performance/acceptance standards for the required QA/QC procedures achieved? Yes ☐ No ☒ (see comment above)

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes ☒ No ☐

As required by the method, the following statements apply;

GZA GeoEnvironmental, Inc.

A N A L Y T I C A L   R E P O R T

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0103-00159

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1. The solvent extraction methods utilized have been demonstrated to achieve the required performance levels through the initial demonstration of capabilities study.
2. Baseline blank correction is routinely performed.
3. The C11-C22 aromatic range is corrected for the 17 target polynuclear aromatic hydrocarbons (PAHs).
4. The reported surrogates are also the fractionation surrogates.

The signature of the report indicates the following attestation (as required by the MA DEP Method);

I attest under the pains and penalties of perjury, that based upon inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is to the best of my knowledge and belief, accurate and complete.

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GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

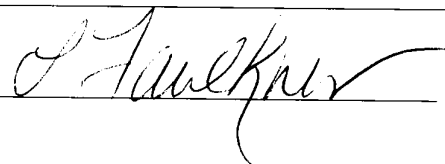
Project Name: Wyman-Gordon

Project No.: 13190.14

Work Order No.: 0103-00159

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Data Authorized By:



% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Soil data is reported on a dry weight basis unless otherwise specified.

Method 8260: The current version of the method is 8260B.

Method 8021: The current version of the method is 8021B.

Method 8270: The current version of the method is 8270C.

Laboratory Identification Numbers:

MA: MA092      NH: 2028

CT: PH0579

NY: 11063      RI: A46

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

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GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH STREET, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
QUALITY CONTROL AQUEOUS

METHOD BLANK

DATE EXTRACTED: 03/28/01

DATE ANALYZED: 03/28/01

8082 COMPOUNDS POLYCHLORINATED BIPHENYLS	CONC. ug/L-PPB	QUANT. LIMIT ug/L-PPB
AROCLOR 1262	ND	0.2
AROCLOR 1260	ND	0.2
AROCLOR 1254	ND	0.2
AROCLOR 1248	ND	0.2
AROCLOR 1242/1016	ND	0.2
AROCLOR 1232	ND	0.2
AROCLOR 1221	ND	0.2

8082 SURROGATES	% RECOVERY	RECOV. LIMITS
TETRACHLORO-M-XYLENE	55.6	20-106
DECACHLOROBIPHENYL	53.6	31-111

LABORATORY CONTROL SAMPLE / DUPLICATE

COMPOUND	LCS RECOVERY (%)	ACCEPTANCE LIMITS (%)	LCS DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
Aroclor 1248	86.3	40-140	1.64	50

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ENVIRONMENTAL CHEMISTRY LABORATORY  
320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02464  
MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8260 ANALYSIS  
PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX

QUALITY CONTROL

DATE: 3/29/01 S

AQUEOUS

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	107	65-127	4.58	20
Trichloroethene	96.5	87-105	1.95	20
Toluene	99.0	86-105	2.37	20

SOLID

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		70-130		35
Trichloroethene		70-130		35
Toluene		70-130		35

METHOD BLANK

TOTAL COMPOUNDS DETECTED	ND
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SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4	94.1	80-114		80-120
Toluene-D8	95.3	88-110		81-117
4-Bromofluorobenzene	99.9	86-115		80-120

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 MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

DATE: 3/30/01 S

**AQUEOUS**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	105	65-127	1.99	20
Trichloroethene	90.8	87-105	4.14	20
Toluene	95.0	86-105	3.53	20

**SOLID**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		70-130		35
Trichloroethene		70-130		35
Toluene		70-130		35

**METHOD BLANK**

<b>TOTAL COMPOUNDS DETECTED</b>	ND
---------------------------------	----

SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4	95.2	80-114		80-120
Toluene-D8	94.9	88-110		81-117
4-Bromofluorobenzene	102	86-115		80-120

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 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 03/29/2001      Aqueous

METHOD BLANK	AQUEOUS ug/L·PPB	SOLID mg/kg · PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 ALIPHATICS	<50	<1.0
C19-C36 ALIPHATICS	<50	<1.0
C10-C22 AROMATICS	<100	<2.0
TOTAL UNWEIGHTED CONC.	<50	<1.0
<b>WEIGHTED CONC.</b>		
C9-C18 ALIPHATICS (0.05 MULT.)	<2.5	<0.05
C19-C36 ALIPHATICS (0.005 MULT.)	<0.25	<0.005
C10-C22 AROMATICS (1.0 MULT.)	<100	<2.0
TOTAL WEIGHTED CONC.	<0.25	<0.005
<b>TARGET COMPOUNDS</b>		
NAPHTHALENE	<10	<0.30
2-METHYLNAPHTHALENE	<10	<0.30
1-METHYLNAPHTHALENE	<10	<0.30
ACENAPHTHYLENE	<10	<0.30
ACENAPHTHENE	<10	<0.30
FLUORENE	<10	<0.30
PHENANTHRENE	<10	<0.30
ANTHRACENE	<10	<0.30
FLUORANTHENE	<10	<0.30
PYRENE	<10	<0.30
BENZO(a)ANTHRACENE	<10	<0.30
CHRYSENE	<10	<0.30
BENZO(b)FLUORANTHENE	<10	<0.30
BENZO(k)FLUORANTHENE	<10	<0.30
BENZO(a)PYRENE	<10	<0.30
INDENO(1,2,3-cd)PYRENE	<10	<0.30
DIBENZO(a,h)ANTHRACENE	<10	<0.30
BENZO(g,h,i)PERYLENE	<10	<0.30

SURROGATE	%RECOV.	LIMITS-AQ.	LIMITS-SOL.
***1-CHLORO-OCTADECANE (AL)	129	40-130	40-116
***p-TERPHENYL(AR)	88.5	50-123	50-135

MATRIX SPIKE/DUPLICATE SPIKE	RECOV.%	LIMITS-AQ.	LIMITS-SOL.
EICOSANE (AL) MS	82.4	40-130	40-116
EICOSANE (AL) MSD	87.4	40-130	40-116
EICOSANE % DIFFERENCE	5.89	35	45
FLUORANTHENE (AR) MS	65.8	50-123	50-135
FLUORANTHENE (AR) MSD	73.3	50-123	50-135
FLUORANTHENE % DIFFERENCE	10.9	35	45

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 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH**  
**EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 03/30/2001      Aqueous

METHOD BLANK	AQUEOUS ug/L-PPB	SOLID mg/kg - PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 ALIPHATICS	<50	<1.0
C19-C36 ALIPHATICS	<50	<1.0
C10-C22 AROMATICS	<100	<2.0
TOTAL UNWEIGHTED CONC.	<50	<1.0
<b>WEIGHTED CONC.</b>		
C9-C18 ALIPHATICS (0.05 MULT.)	<2.5	<0.05
C19-C36 ALIPHATICS (0.005 MULT.)	<0.25	<0.005
C10-C22 AROMATICS (1.0 MULT.)	<100	<2.0
TOTAL WEIGHTED CONC.	<0.25	<0.005
<b>TARGET COMPOUNDS</b>		
NAPHTHALENE	<10	<0.30
2-METHYLNAPHTHALENE	<10	<0.30
1-METHYLNAPHTHALENE	<10	<0.30
ACENAPHTHYLENE	<10	<0.30
ACENAPHTHENE	<10	<0.30
FLUORENE	<10	<0.30
PHENANTHRENE	<10	<0.30
ANTHRACENE	<10	<0.30
FLUORANTHENE	<10	<0.30
PYRENE	<10	<0.30
BENZO(a)ANTHRACENE	<10	<0.30
CHRYSENE	<10	<0.30
BENZO(b)FLUORANTHENE	<10	<0.30
BENZO(k)FLUORANTHENE	<10	<0.30
BENZO(a)PYRENE	<10	<0.30
INDENO(1,2,3-cd)PYRENE	<10	<0.30
DIBENZO(a,h)ANTHRACENE	<10	<0.30
BENZO(g,h,i)PERYLENE	<10	<0.30

SURROGATE	%RECOV.	LIMITS-AQ.	LIMITS-SOL.
***1-CHLORO-OCTADECANE (AL)	97.7	40-130	40-116
***p-TERPHENYL(AR)	122	50-123	50-135

MATRIX SPIKE/DUPLICATE SPIKE	RECOV.%	LIMITS-AQ.	LIMITS-SOL.
EICOSANE (AL) MS	99.7	40-130	40-116
EICOSANE (AL) MSD	84.9	40-130	40-116
EICOSANE % DIFFERENCE	16.0	35	45
FLUORANTHENE (AR) MS	94.5	50-123	50-135
FLUORANTHENE (AR) MSD	77.3	50-123	50-135
FLUORANTHENE % DIFFERENCE	20.1	35	45

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 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 4/6/2001      Aqueous

<b>METHOD BLANK</b>	<b>AQUEOUS</b> ug/L-PPB	<b>SOLID</b> mg/kg · PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 ALIPHATICS	<50	<1.0
C19-C36 ALIPHATICS	<50	<1.0
C10-C22 AROMATICS	<100	<2.0
TOTAL UNWEIGHTED CONC.	<50	<1.0
<b>WEIGHTED CONC.</b>		
C9-C18 ALIPHATICS (0.05 MULT.)	<2.5	<0.05
C19-C36 ALIPHATICS (0.005 MULT.)	<0.25	<0.005
C10-C22 AROMATICS (1.0 MULT.)	<100	<2.0
TOTAL WEIGHTED CONC.	<0.25	<0.005
<b>TARGET COMPOUNDS</b>		
NAPHTHALENE	<10	<0.30
2-METHYLNAPHTHALENE	<10	<0.30
1-METHYLNAPHTHALENE	<10	<0.30
ACENAPHTHYLENE	<10	<0.30
ACENAPHTHENE	<10	<0.30
FLUORENE	<10	<0.30
PHENANTHRENE	<10	<0.30
ANTHRACENE	<10	<0.30
FLUORANTHENE	<10	<0.30
PYRENE	<10	<0.30
BENZO(a)ANTHRACENE	<10	<0.30
CHRYSENE	<10	<0.30
BENZO(b)FLUORANTHENE	<10	<0.30
BENZO(k)FLUORANTHENE	<10	<0.30
BENZO(a)PYRENE	<10	<0.30
INDENO(1,2,3-cd)PYRENE	<10	<0.30
DIBENZO(a,h)ANTHRACENE	<10	<0.30
BENZO(g,h,i)PERYLENE	<10	<0.30

<b>SURROGATE</b>	<b>%RECOV.</b>	<b>LIMITS-AQ.</b>	<b>LIMITS-SOL.</b>
***1-CHLORO-OCTADECANE (AL)	104	40-130	40-116
***p-TERPHENYL(AR)	82.7	50-123	50-135

<b>MATRIX SPIKE/DUPLICATE SPIKE</b>	<b>RECOV.%</b>	<b>LIMITS-AQ.</b>	<b>LIMITS-SOL.</b>
EICOSANE (AL) MS	99.7	40-130	40-116
EICOSANE (AL) MSD	84.9	40-130	40-116
EICOSANE % DIFFERENCE	16.0	35	45
FLUORANTHENE (AR) MS	94.5	50-123	50-135
FLUORANTHENE (AR) MSD	77.3	50-123	50-135
FLUORANTHENE % DIFFERENCE	20.1	35	45





## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 13190.14

Work Order No.: 0103-00177

Sample ID: SED-5B-032801

Sample Date: 3/28/2001

Sample No.: 005

Test Performed	Method	Results	Units	Tech	Analysis Date
Chlorobenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
1,1,1,2-Tetrachloroethane	EPA 8260	< 250	ug/kg	NCS	4/06/01
Ethylbenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
m&p-Xylene	EPA 8260	< 250	ug/kg	NCS	4/06/01
o-Xylene	EPA 8260	< 250	ug/kg	NCS	4/06/01
Styrene	EPA 8260	< 250	ug/kg	NCS	4/06/01
Bromoform	EPA 8260	< 500	ug/kg	NCS	4/06/01
Isopropylbenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 250	ug/kg	NCS	4/06/01
1,2,3-Trichloropropane	EPA 8260	< 250	ug/kg	NCS	4/06/01
Bromobenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
n-Propylbenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
2-Chlorotoluene	EPA 8260	< 250	ug/kg	NCS	4/06/01
1,3,5-Trimethylbenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
4-Chlorotoluene	EPA 8260	< 250	ug/kg	NCS	4/06/01
tert-Butylbenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
1,2,4-Trimethylbenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
sec-Butylbenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
p-Isopropyltoluene	EPA 8260	< 250	ug/kg	NCS	4/06/01
1,3-Dichlorobenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
1,4-Dichlorobenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
n-Butylbenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
1,2-Dichlorobenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 1300	ug/kg	NCS	4/06/01
1,2,4-Trichlorobenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
Hexachlorobutadiene	EPA 8260	< 250	ug/kg	NCS	4/06/01
Naphthalene	EPA 8260	< 250	ug/kg	NCS	4/06/01
1,2,3-Trichlorobenzene	EPA 8260	< 250	ug/kg	NCS	4/06/01
Surrogates:	EPA 8260				
***1,2-Dichloroethane-D4	EPA 8260	95.0	% R	NCS	4/06/01
***Toluene-D8	EPA 8260	99.3	% R	NCS	4/06/01
***4-Bromofluorobenzene	EPA 8260	91.9	% R	NCS	4/06/01
Preparation		50	DF	NCS	4/06/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/03/01
Aroclor 1262	EPA 8082	< 250000	ug/kg	RJD	4/03/01
Aroclor 1260	EPA 8082	< 250000	ug/kg	RJD	4/03/01
Aroclor 1254	EPA 8082	510000	ug/kg	RJD	4/03/01
Aroclor 1248	EPA 8082	< 250000	ug/kg	RJD	4/03/01
Aroclor 1242/1016	EPA 8082	< 250000	ug/kg	RJD	4/03/01
Aroclor 1232	EPA 8082	< 250000	ug/kg	RJD	4/03/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 13190.14

Work Order No.: 0103-00177

Sample ID: SED-5B-032801

Sample Date: 3/28/2001

Sample No.: 005

Test Performed	Method	Results	Units	Tech	Analysis Date
Aroclor 1221	EPA 8082	< 250000	ug/kg	RJD	4/03/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	102	% R	RJD	4/03/01
***Decachlorobiphenyl	EPA 8082	100	% R	RJD	4/03/01
Extraction		20000	DF	KJW	3/30/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/05/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	2200	mg/kg	OMS	4/05/01
C9-C18 Aliphatic Fraction	MADEP	510	mg/kg	OMS	4/05/01
C19-C36 Aliphatic Fraction	MADEP	9800	mg/kg	OMS	4/05/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	2200	mg/kg	OMS	4/05/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116 %R	MADEP	D.O.	* %R	OMS	4/05/01
***p-Terphenyl (aromatic): 50-135 %R	MADEP	D.O.	* %R	OMS	4/05/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 1.2	mg/kg	OMS	4/05/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 1.2	mg/kg	OMS	4/05/01
Acenaphthylene (Diesel PAH)	MADEP	< 1.2	mg/kg	OMS	4/05/01
Acenaphthene (Diesel PAH)	MADEP	< 1.2	mg/kg	OMS	4/05/01
Fluorene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Phenanthrene (Diesel PAH)	MADEP	< 1.2	mg/kg	OMS	4/05/01
Anthracene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Fluoranthene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Pyrene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Benzo [a] Anthracene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Chrysene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Benzo [b] Fluoranthene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Benzo [k] Fluoranthene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Benzo [a] Pyrene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Dibenzo [a,h] Anthracene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Benzo [g,h,i] Perylene	MADEP	< 1.2	mg/kg	OMS	4/05/01
Extraction	SONICATION	< 1.2	mg/kg	OMS	4/05/01
Sample information can be found on the COC.		20	DF	AHW	4/02/01
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	12300	mg/Kg	BJP	4/05/01
Barium	EPA 6010	90.3	mg/Kg	BJP	4/05/01
Magnesium	EPA 6010	2470	mg/Kg	BJP	4/05/01
PRIORITY POLLUTANT METALS				BJP	4/05/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0103-00177

Sample ID: SED-6B-032801  
Sample Date: 3/28/2001

Sample No.: 006

Test Performed	Method	Results	Units	Tech	Analysis Date
Chlorobenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
1,1,1,2-Tetrachloroethane	EPA 8260	< 150	ug/kg	NCS	4/06/01
Ethylbenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
m&p-Xylene	EPA 8260	< 150	ug/kg	NCS	4/06/01
o-Xylene	EPA 8260	< 150	ug/kg	NCS	4/06/01
Styrene	EPA 8260	< 150	ug/kg	NCS	4/06/01
Bromoform	EPA 8260	< 300	ug/kg	NCS	4/06/01
Isopropylbenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 150	ug/kg	NCS	4/06/01
1,2,3-Trichloropropane	EPA 8260	< 150	ug/kg	NCS	4/06/01
Bromobenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
n-Propylbenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
2-Chlorotoluene	EPA 8260	< 150	ug/kg	NCS	4/06/01
1,3,5-Trimethylbenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
4-Chlorotoluene	EPA 8260	< 150	ug/kg	NCS	4/06/01
tert-Butylbenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
1,2,4-Trimethylbenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
sec-Butylbenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
p-Isopropyltoluene	EPA 8260	< 150	ug/kg	NCS	4/06/01
1,3-Dichlorobenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
1,4-Dichlorobenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
n-Butylbenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
1,2-Dichlorobenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 750	ug/kg	NCS	4/06/01
1,2,4-Trichlorobenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
Hexachlorobutadiene	EPA 8260	< 150	ug/kg	NCS	4/06/01
Naphthalene	EPA 8260	< 150	ug/kg	NCS	4/06/01
1,2,3-Trichlorobenzene	EPA 8260	< 150	ug/kg	NCS	4/06/01
Surrogates:	EPA 8260				
***1,2-Dichloroethane-D4	EPA 8260	99.5	% R	NCS	4/06/01
***Toluene-D8	EPA 8260	96.4	% R	NCS	4/06/01
***4-Bromofluorobenzene	EPA 8260	90.9	% R	NCS	4/06/01
Preparation		30	DF	NCS	4/06/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	3/30/01
Aroclor 1262	EPA 8082	< 25	ug/kg	RJD	3/30/01
Aroclor 1260	EPA 8082	< 25	ug/kg	RJD	3/30/01
Aroclor 1254	EPA 8082	< 25	ug/kg	RJD	3/30/01
Aroclor 1248	EPA 8082	< 25	ug/kg	RJD	3/30/01
Aroclor 1242/1016	EPA 8082	< 25	ug/kg	RJD	3/30/01
Aroclor 1232	EPA 8082	< 25	ug/kg	RJD	3/30/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0103-00177

Sample ID: SED-6B-032801  
Sample Date: 3/28/2001

Sample No.: 006

Test Performed	Method	Results	Units	Tech	Analysis Date
Aroclor 1221	EPA 8082	< 25	ug/kg	RJD	3/30/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	73.5	% R	RJD	3/30/01
***Decachlorobiphenyl	EPA 8082	71.6	% R	RJD	3/30/01
Extraction		1.0	DF	KJW	3/30/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/05/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	6.6	mg/kg	OMS	4/05/01
C9-C18 Aliphatic Fraction	MADEP	< 2.0	mg/kg	OMS	4/05/01
C19-C36 Aliphatic Fraction	MADEP	27	mg/kg	OMS	4/05/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	6.6	mg/kg	OMS	4/05/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116 %R	MADEP	125	* %R	OMS	4/05/01
***p-Terphenyl (aromatic): 50-135 %R	MADEP	73.2	%R	OMS	4/05/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/05/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/05/01
Acenaphthylene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/05/01
Acenaphthene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/05/01
Fluorene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Phenanthrene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/05/01
Anthracene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Pyrene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Benzo [a] Anthracene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Chrysene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Benzo [b] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Benzo [k] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Benzo [a] Pyrene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Dibenzo [a,h] Anthracene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Benzo [g,h,i] Perylene	MADEP	< 0.30	mg/kg	OMS	4/05/01
Extraction	SONICATION	< 0.30	mg/kg	OMS	4/05/01
Sample information can be found on the COC.		1.0	DF	AHW	4/02/01
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	8850	mg/Kg	BJP	4/05/01
Barium	EPA 6010	28.2	mg/Kg	BJP	4/05/01
Magnesium	EPA 6010	1190	mg/Kg	BJP	4/05/01
PRIORITY POLLUTANT METALS				BJP	4/05/01

ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 13190.14

Work Order No.: 0103-00177

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PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 03/29/01 via   x   GZA courier,    EC,    FEDEX, or    hand delivered.

The temperature of the   x   temperature blank,    cooler air was 0.3 degrees C. Sample ID SED-2B-032801: 2 VOAs instead of 1. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference, including methanol preservation of soil samples for volatile analyses (preparation method 5035).

2. EPA Method 8082

Attach QC 8082 03/30/01 - Solid

3. EPA Method 8260

The increased reporting limits in some of the above samples are due to the solid content combined with sub-sample volume submitted for analysis.

Attach QC 8260 04/05/01 - G

Attach QC 8260 04/06/01 - G

4. MADEP EPH

The elevated aliphatic recoveries in the above samples are due to co-elution with a petroleum constituent.

The increased reporting limits in sample SED-5B-032801 are due to the concentration of petroleum present.

Attach QC EPH 04/02/01 - Solid

MA DEP EPH Method Statement:

The containers were:   X   Satisfactory,    Broken,    Leaking.

Were all QA/QC procedures required by the EPH Method followed?  
Yes   X   No   

Were all performance/acceptance standards for the required QA/QC

ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 13190.14

Work Order No.: 0103-00177

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procedures achieved? Yes ☐ No ☒ (see comment above)

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes ☒ No ☐

As required by the method, the following statements apply;

1. The solvent extraction methods utilized have been demonstrated to achieve the required performance levels through the initial demonstration of capabilities study.
2. Baseline blank correction is routinely performed.
3. The C11-C22 aromatic range is corrected for the 17 target polynuclear aromatic hydrocarbons (PAHs).
4. The reported surrogates are also the fractionation surrogates.

The signature of the report indicates the following attestation (as required by the MA DEP Method);

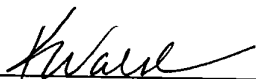
I attest under the pains and penalties of perjury, that based upon inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is to the best of my knowledge and belief, accurate and complete.

ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0103-00177

Data Authorized By: \_\_\_\_\_



% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Soil data is reported on a dry weight basis unless otherwise specified.

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.

Laboratory Identification Numbers:

MA: MA092      NH: 2028  
CT: PH0579  
NY: 11063      RI: A46

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
 QUALITY CONTROL SOLID

METHOD BLANK

DATE EXTRACTED: 03/30/01

DATE ANALYZED: 03/30/01

8082 COMPOUNDS POLYCHLORINATED BIPHENYLS	CONC. ug/L-PPB	QUANT. LIMIT ug/L-PPB
AROCLOR 1262	ND	5.0
AROCLOR 1260	ND	5.0
AROCLOR 1254	ND	5.0
AROCLOR 1248	ND	5.0
AROCLOR 1242/1016	ND	5.0
AROCLOR 1232	ND	10
AROCLOR 1221	ND	5.0

8082 SURROGATES	% RECOVERY	RECOV. LIMITS
TETRACHLORO-M-XYLENE	59.6	45-147
DECACHLOROBIPHENYL	62.9	27-138

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
Aroclor 1242	102	40-140	24.9	50



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 106 SOUTH STREET, HOPKINTON, MA 01748 (508) 435-9244  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 04/02/2001      Solid

METHOD BLANK	AQUEOUS ug/L-PPB	SOLID mg/kg · PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 ALIPHATICS	<50	<1.0
C19-C36 ALIPHATICS	<50	<1.0
C10-C22 AROMATICS	<100	<2.0
TOTAL UNWEIGHTED CONC.	<50	<1.0
<b>WEIGHTED CONC.</b>		
C9-C18 ALIPHATICS (0.05 MULT.)	<2.5	<0.05
C19-C36 ALIPHATICS (0.005 MULT.)	<0.25	<0.005
C10-C22 AROMATICS (1.0 MULT.)	<100	<2.0
TOTAL WEIGHTED CONC.	<0.25	<0.005
<b>TARGET COMPOUNDS</b>		
NAPHTHALENE	<10	<0.30
2-METHYLNAPHTHALENE	<10	<0.30
1-METHYLNAPHTHALENE	<10	<0.30
ACENAPHTHYLENE	<10	<0.30
ACENAPHTHENE	<10	<0.30
FLUORENE	<10	<0.30
PHENANTHRENE	<10	<0.30
ANTHRACENE	<10	<0.30
FLUORANTHENE	<10	<0.30
PYRENE	<10	<0.30
BENZO(a)ANTHRACENE	<10	<0.30
CHRYSENE	<10	<0.30
BENZO(b)FLUORANTHENE	<10	<0.30
BENZO(k)FLUORANTHENE	<10	<0.30
BENZO(a)PYRENE	<10	<0.30
INDENO(1,2,3-cd)PYRENE	<10	<0.30
DIBENZO(a,h)ANTHRACENE	<10	<0.30
BENZO(g,h,i)PERYLENE	<10	<0.30

SURROGATE	%RECOV.	LIMITS-AQ.	LIMITS-SOL.
***1-CHLORO-OCTADECANE (AL)	108	40-130	40-116
***p-TERPHENYL(AR)	76.2	50-123	50-135

MATRIX SPIKE/DUPLICATE SPIKE	RECOV.%	LIMITS-AQ.	LIMITS-SOL.
EICOSANE (AL) MS	101	40-130	40-116
EICOSANE (AL) MSD	130	40-130	40-116
EICOSANE % DIFFERENCE	25.4	35	45
FLUORANTHENE (AR) MS	76.2	50-123	50-135
FLUORANTHENE (AR) MSD	87.1	50-123	50-135
FLUORANTHENE % DIFFERENCE	13.3	35	45

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02464  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

DATE: 4/5/01 G

**AQUEOUS**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		65-127		20
Trichloroethene		87-105		20
Toluene		86-105		20

**SOLID**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	111	70-130	0.41	35
Trichloroethene	105	70-130	3.16	35
Toluene	109	70-130	4.99	35

**METHOD BLANK**

TOTAL COMPOUNDS DETECTED	ND
--------------------------	----

SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4		80-114	94.0	80-120
Toluene-D8		88-110	92.4	81-117
4-Bromofluorobenzene		86-115	86.9	80-120

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 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02464  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

DATE: 4/6/01 G

**AQUEOUS**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		65-127		20
Trichloroethene		87-105		20
Toluene		86-105		20

**SOLID**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	104	70-130	1.19	35
Trichloroethene	107	70-130	0.91	35
Toluene	110	70-130	4.16	35

**METHOD BLANK**

<b>TOTAL COMPOUNDS DETECTED</b>	ND
---------------------------------	----

SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4		80-114	112	80-120
Toluene-D8		88-110	94.5	81-117
4-Bromofluorobenzene		86-115	86.0	80-120

## CHAIN-OF-CUSTODY RECORD

**W.O. #**

0103-001  
(for lab use only)

Sample I.D.		Date/Time Sampled (Very Important)	Matrix	ANALYSIS REQUIRED																Total # of Cont.	Note #							
			A=Air S=Soil GW=Ground W. SW=Surface W. DW=Drinking W. Other (specify)	LPH J Cond	HNU	GC Screen (VDA)	J 524 2 J 502 1	624	J 601 J 602	625	8260	8260-8240 List	8021	8021-8010 List	8021-8020 List	8270 J PAH J A J BN	9082 PCBs Only	9081 Pest Only	TPH-GC (Mod 8100)	TPH-GC w/FING	EPH (MA DEP) PPAH	VPH (MA DEP)	TCLP (Spec Below)	Filtering (if requested)	Metals 3PPM-13 J R-B	Metals (List Below)		
SOL-1B-031801	3/18/01	13:00	GWL								X						X				X				X		7	
SOL-3B-031801	3/18/01	15:30	GWL																							X	7	
SOL-5B-031801	3/18/01	17:30	GWL																								6	
SOL-7B-031801	3/18/01	12:45	GWL																								6	
SOL-1B-031801	3/18/01	13:00	SSED																								3	
SOL-2A-031801	3/18/01	13:30																									3	
SOL-3B-031801	3/18/01	15:45																									3	
SOL-4B-031801	3/18/01	15:50																									3	
SOL-5B-031801	3/18/01	17:30																									3	
SOL-6B-031801	3/18/01	17:45																									3	
SOL-7B-031801	3/18/01	12:45	/																								3	

PRESERVATIVE (Cl - HCl, MeOH, N - HNO<sub>3</sub>, S - H<sub>2</sub>SO<sub>4</sub>, Na - NaOH, O - Other)  
CONTAINER TYPE (P-Plastic, G-Glass, V-Vial, T-Teflon, O-Other)

RELINQUISHED BY: DATE/TIME RECEIVED BY: DATE/TIME  
T. Briggs 10:50 3/18/01 C. Briggs 3/18/01  
RECEIVED BY: 3:29.01  
RELINQUISHED BY: DATE/TIME RECEIVED BY: DATE/TIME  
RECEIVED BY: 1:30

PROJECT MANAGER: T. Briggs EXT:

TURNAROUND TIME: Standard Rush Days, Approved by: LAB USE: TEMP OF COOLER 0.3°C

GZA FILE NO: PROJECT: Location: Western Area  
Collector(s): T. Briggs and M. Briggs

GZA GEOTECHNICAL, INC.  
ENGINEERS AND SCIENTISTS  
320 Needham Street  
NEWTON UPPER FALLS, MA 02464-1594  
(617) 969-0050  
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GZAP003 SHEET 1 OF 1

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00017

Sample ID: G-TP4-S1  
 Sample Date: 4/02/2001

Sample No.: 013

Test Performed	Method	Results	Units	Tech	Analysis Date
Chlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,1,1,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/09/01
Ethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
m&p-Xylene	EPA 8260	< 100	ug/kg	NCS	4/09/01
o-Xylene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Styrene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Bromoform	EPA 8260	< 200	ug/kg	NCS	4/09/01
Isopropylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,3-Trichloropropane	EPA 8260	< 100	ug/kg	NCS	4/09/01
Bromobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
n-Propylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
2-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,3,5-Trimethylbenzene	EPA 8260	320	ug/kg	NCS	4/09/01
4-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
tert-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,4-Trimethylbenzene	EPA 8260	1100	ug/kg	NCS	4/09/01
sec-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
p-Isopropyltoluene	EPA 8260	340	ug/kg	NCS	4/09/01
1,3-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,4-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
n-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 500	ug/kg	NCS	4/09/01
1,2,4-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Hexachlorobutadiene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Naphthalene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,3-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Surrogates:	EPA 8260				
***1,2-Dichloroethane-D4	EPA 8260	117	% R	NCS	4/09/01
***Toluene-D8	EPA 8260	98.8	% R	NCS	4/09/01
***4-Bromofluorobenzene	EPA 8260	96.6	% R	NCS	4/09/01
Preparation		20	DF	NCS	4/09/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/09/01
Aroclor 1262	EPA 8082	< 150000	ug/kg	RJD	4/09/01
Aroclor 1260	EPA 8082	< 150000	ug/kg	RJD	4/09/01
Aroclor 1254	EPA 8082	320000	ug/kg	RJD	4/09/01
Aroclor 1248	EPA 8082	< 150000	ug/kg	RJD	4/09/01
Aroclor 1242/1016	EPA 8082	< 150000	ug/kg	RJD	4/09/01
Aroclor 1232	EPA 8082	< 150000	ug/kg	RJD	4/09/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00017

Sample ID: G-TP4-S1  
 Sample Date: 4/02/2001

Sample No.: 013

Test Performed	Method	Results	Units	Tech	Analysis Date
Aroclor 1221	EPA 8082	< 150000	ug/kg	RJD	4/09/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	45.8	% R	RJD	4/09/01
***Decachlorobiphenyl	EPA 8082	107	% R	RJD	4/09/01
Extraction		12000	DF	KJW	4/05/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/07/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	1900	mg/kg	OMS	4/07/01
C9-C18 Aliphatic Fraction	MADEP	1000	mg/kg	OMS	4/09/01
C19-C36 Aliphatic Fraction	MADEP	11000	mg/kg	OMS	4/09/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	< 5.0	mg/kg	OMS	4/07/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116 %R	MADEP	DO	* %R	OMS	4/09/01
***p-Terphenyl (aromatic): 50-135 %R	MADEP	DO	* %R	OMS	4/07/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 0.75	mg/kg	OMS	4/07/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 0.75	mg/kg	OMS	4/07/01
Acenaphthylene (Diesel PAH)	MADEP	< 0.75	mg/kg	OMS	4/07/01
Acenaphthene (Diesel PAH)	MADEP	< 0.75	mg/kg	OMS	4/07/01
Fluorene	MADEP	< 0.75	mg/kg	OMS	4/07/01
Phenanthrene (Diesel PAH)	MADEP	1.3	mg/kg	OMS	4/07/01
Anthracene	MADEP	< 0.75	mg/kg	OMS	4/07/01
Fluoranthene	MADEP	2.1	mg/kg	OMS	4/07/01
Pyrene	MADEP	1.4	mg/kg	OMS	4/07/01
Benzo [a] Anthracene	MADEP	1.0	mg/kg	OMS	4/07/01
Chrysene	MADEP	1.3	mg/kg	OMS	4/07/01
Benzo [b] Fluoranthene	MADEP	1.4	mg/kg	OMS	4/07/01
Benzo [k] Fluoranthene	MADEP	1.1	mg/kg	OMS	4/07/01
Benzo [a] Pyrene	MADEP	2.0	mg/kg	OMS	4/07/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 0.75	mg/kg	OMS	4/07/01
Dibenzo [a,h] Anthracene	MADEP	< 0.75	mg/kg	OMS	4/07/01
Benzo [g,h,i] Perylene	MADEP	< 0.75	mg/kg	OMS	4/07/01
Extraction	SONICATION	2.5	DF	MQS	4/06/01
Sample information can be found on the COC.					
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	11600	mg/Kg	BJP	4/09/01
Barium	EPA 6010	143	mg/Kg	BJP	4/09/01
Magnesium	EPA 6010	3940	mg/Kg	BJP	4/09/01
PRIORITY POLLUTANT METALS				BJP	4/09/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00017

Sample ID: G-TP4-S2  
 Sample Date: 4/02/2001

Sample No.: 014

Test Performed	Method	Results	Units	Tech	Analysis Date
Chlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,1,1,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/09/01
Ethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
m&p-Xylene	EPA 8260	< 100	ug/kg	NCS	4/09/01
o-Xylene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Styrene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Bromoform	EPA 8260	< 200	ug/kg	NCS	4/09/01
Isopropylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,3-Trichloropropane	EPA 8260	< 100	ug/kg	NCS	4/09/01
Bromobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
n-Propylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
2-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,3,5-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
4-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
tert-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,4-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
sec-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
p-Isopropyltoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,3-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,4-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
n-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 500	ug/kg	NCS	4/09/01
1,2,4-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Hexachlorobutadiene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Naphthalene	EPA 8260	640	ug/kg	NCS	4/09/01
1,2,3-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Surrogates:	EPA 8260				
***1,2-Dichloroethane-D4	EPA 8260	114	% R	NCS	4/09/01
***Toluene-D8	EPA 8260	101	% R	NCS	4/09/01
***4-Bromofluorobenzene	EPA 8260	96.5	% R	NCS	4/09/01
Preparation		20	DF	NCS	4/09/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/05/01
Aroclor 1262	EPA 8082	< 75	ug/kg	RJD	4/05/01
Aroclor 1260	EPA 8082	< 75	ug/kg	RJD	4/05/01
Aroclor 1254	EPA 8082	170	ug/kg	RJD	4/05/01
Aroclor 1248	EPA 8082	< 75	ug/kg	RJD	4/05/01
Aroclor 1242/1016	EPA 8082	< 75	ug/kg	RJD	4/05/01
Aroclor 1232	EPA 8082	< 75	ug/kg	RJD	4/05/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00017

Sample ID: G-TP4-S2  
 Sample Date: 4/02/2001

Sample No.: 014

Test Performed	Method	Results	Units	Tech	Analysis Date
Aroclor 1221	EPA 8082	< 75	ug/kg	RJD	4/05/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	64.6	% R	RJD	4/05/01
***Decachlorobiphenyl	EPA 8082	61.0	% R	RJD	4/05/01
Extraction		3.0	DF	KJW	4/05/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/08/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	< 2.0	mg/kg	OMS	4/08/01
C9-C18 Aliphatic Fraction	MADEP	< 2.0	mg/kg	OMS	4/08/01
C19-C36 Aliphatic Fraction	MADEP	5.8	mg/kg	OMS	4/08/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	< 2.0	mg/kg	OMS	4/08/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116%R	MADEP	104	%R	OMS	4/08/01
***p-Terphenyl (aromatic): 50-135%R	MADEP	29.2	* %R	OMS	4/08/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Acenaphthylene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Acenaphthene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Fluorene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Phenanthrene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Anthracene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Pyrene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [a] Anthracene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Chrysene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [b] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [k] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [a] Pyrene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Dibenzo [a,h] Anthracene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [g,h,i] Perylene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Extraction	SONICATION	1.0	DF	TLD	4/05/01
Sample information can be found on the COC.					
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	11700	mg/Kg	BJP	4/09/01
Barium	EPA 6010	73.0	mg/Kg	BJP	4/09/01
Magnesium	EPA 6010	3370	mg/Kg	BJP	4/09/01
PRIORITY POLLUTANT METALS				BJP	4/09/01



GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00017

Sample ID: W10-TP2-S1  
 Sample Date: 4/02/2001

Sample No.: 017

Test Performed	Method	Results	Units	Tech	Analysis Date
Chlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,1,1,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/09/01
Ethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
m&p-Xylene	EPA 8260	< 100	ug/kg	NCS	4/09/01
o-Xylene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Styrene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Bromoform	EPA 8260	< 200	ug/kg	NCS	4/09/01
Isopropylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,3-Trichloropropane	EPA 8260	< 100	ug/kg	NCS	4/09/01
Bromobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
n-Propylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
2-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,3,5-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
4-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
tert-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,4-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
sec-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
p-Isopropyltoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,3-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,4-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
n-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 500	ug/kg	NCS	4/09/01
1,2,4-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Hexachlorobutadiene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Naphthalene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,3-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Surrogates:	EPA 8260				
***1,2-Dichloroethane-D4	EPA 8260	108	% R	NCS	4/09/01
***Toluene-D8	EPA 8260	96.4	% R	NCS	4/09/01
***4-Bromofluorobenzene	EPA 8260	96.6	% R	NCS	4/09/01
Preparation		20	DF	NCS	4/09/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/06/01
Aroclor 1262	EPA 8082	< 5000	ug/kg	RJD	4/06/01
Aroclor 1260	EPA 8082	< 5000	ug/kg	RJD	4/06/01
Aroclor 1254	EPA 8082	8100	ug/kg	RJD	4/06/01
Aroclor 1248	EPA 8082	< 5000	ug/kg	RJD	4/06/01
Aroclor 1242/1016	EPA 8082	< 5000	ug/kg	RJD	4/06/01
Aroclor 1232	EPA 8082	< 5000	ug/kg	RJD	4/06/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00017

Sample ID: W10-TP2-S1  
 Sample Date: 4/02/2001

Sample No.: 017

Test Performed	Method	Results	Units	Tech	Analysis Date
Aroclor 1221	EPA 8082	< 5000	ug/kg	RJD	4/06/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	73.8	% R	RJD	4/06/01
***Decachlorobiphenyl	EPA 8082	81.0	% R	RJD	4/06/01
Extraction		300	DF	KJW	4/05/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/08/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	19	mg/kg	OMS	4/08/01
C9-C18 Aliphatic Fraction	MADEP	4.5	mg/kg	OMS	4/08/01
C19-C36 Aliphatic Fraction	MADEP	94	mg/kg	OMS	4/08/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	19	mg/kg	OMS	4/08/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116 %R	MADEP	90.7	%R	OMS	4/08/01
***p-Terphenyl (aromatic): 50-135 %R	MADEP	70.0	%R	OMS	4/08/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Acenaphthylene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Acenaphthene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Fluorene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Phenanthrene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Anthracene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Pyrene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [a] Anthracene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Chrysene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [b] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [k] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [a] Pyrene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Dibenzo [a,h] Anthracene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [g,h,i] Perylene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Extraction	SONICATION	1.0	DF	MQS	4/06/01
Sample information can be found on the COC.					
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	73600	mg/Kg	BJP	4/11/01
Barium	EPA 6010	40.3	mg/Kg	BJP	4/09/01
Magnesium	EPA 6010	5030	mg/Kg	BJP	4/09/01
PRIORITY POLLUTANT METALS				BJP	4/09/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00017

Sample ID: W18-TP1-S1  
 Sample Date: 4/02/2001

Sample No.: 018

Test Performed	Method	Results	Units	Tech	Analysis Date
Chlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,1,1,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/09/01
Ethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
m&p-Xylene	EPA 8260	< 100	ug/kg	NCS	4/09/01
o-Xylene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Styrene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Bromoform	EPA 8260	< 200	ug/kg	NCS	4/09/01
Isopropylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,3-Trichloropropane	EPA 8260	< 100	ug/kg	NCS	4/09/01
Bromobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
n-Propylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
2-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,3,5-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
4-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
tert-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,4-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
sec-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
p-Isopropyltoluene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,3-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,4-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
n-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 500	ug/kg	NCS	4/09/01
1,2,4-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Hexachlorobutadiene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Naphthalene	EPA 8260	< 100	ug/kg	NCS	4/09/01
1,2,3-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/09/01
Surrogates:	EPA 8260				
***1,2-Dichloroethane-D4	EPA 8260	108	% R	NCS	4/09/01
***Toluene-D8	EPA 8260	97.9	% R	NCS	4/09/01
***4-Bromofluorobenzene	EPA 8260	94.1	% R	NCS	4/09/01
Preparation		20	DF	NCS	4/09/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/06/01
Aroclor 1262	EPA 8082	< 750	ug/kg	RJD	4/06/01
Aroclor 1260	EPA 8082	900	ug/kg	RJD	4/06/01
Aroclor 1254	EPA 8082	2100	ug/kg	RJD	4/06/01
Aroclor 1248	EPA 8082	< 750	ug/kg	RJD	4/06/01
Aroclor 1242/1016	EPA 8082	< 750	ug/kg	RJD	4/06/01
Aroclor 1232	EPA 8082	< 750	ug/kg	RJD	4/06/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00017

Sample ID: W18-TP1-S1  
 Sample Date: 4/02/2001

Sample No.: 018

Test Performed	Method	Results	Units	Tech	Analysis Date
Aroclor 1221	EPA 8082	< 750	ug/kg	RJD	4/06/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	76.6	% R	RJD	4/06/01
***Decachlorobiphenyl	EPA 8082	84.5	% R	RJD	4/06/01
Extraction		60	DF	KJW	4/05/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/08/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	23	mg/kg	OMS	4/08/01
C9-C18 Aliphatic Fraction	MADEP	4.6	mg/kg	OMS	4/08/01
C19-C36 Aliphatic Fraction	MADEP	110	mg/kg	OMS	4/08/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	22	mg/kg	OMS	4/08/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116 %R	MADEP	87.3	%R	OMS	4/08/01
***p-Terphenyl (aromatic): 50-135 %R	MADEP	67.5	%R	OMS	4/08/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Acenaphthylene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Acenaphthene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Fluorene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Phenanthrene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/08/01
Anthracene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Fluoranthene	MADEP	0.34	mg/kg	OMS	4/08/01
Pyrene	MADEP	0.35	mg/kg	OMS	4/08/01
Benzo [a] Anthracene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Chrysene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [b] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [k] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [a] Pyrene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Dibenzo [a,h] Anthracene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Benzo [g,h,i] Perylene	MADEP	< 0.30	mg/kg	OMS	4/08/01
Extraction	SONICATION	1.0	DF	MQS	4/06/01
Sample information can be found on the COC.					
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	97000	mg/Kg	BJP	4/11/01
Barium	EPA 6010	57.3	mg/Kg	BJP	4/09/01
Magnesium	EPA 6010	5720	mg/Kg	BJP	4/09/01
PRIORITY POLLUTANT METALS				BJP	4/09/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 13190.14

Work Order No.: 0104-00017

## PROJECT NARRATIVE:

## 1. Sample Receipt

The samples were received on 04/3/01 via    GZA courier,    EC,    FEDEX, or   x   hand delivered.

The temperature of the   x   temperature blank,    cooler air was 1.5 degrees C. The samples were received intact for all requested analyses.

G-TP6-S2: analysis not selected, PM contacted (assumed on hold)

The samples were appropriately preserved in accordance with the method they reference, including methanol preservation of soil samples for volatile analyses (preparation method 5035).

## 2. EPA Method 8082

Attach QC 8082 04/04/01 - Solid

## 3. EPA Method 8260

Attach QC 8260 04/06/01 - G

Attach QC 8260 04/09/01 - G

## 4. MADEP EPH

The low aromatic surrogate recoveries were not confirmed as matrix interference by re-analysis due to the required project TAT.

Attach QC EPH 04/05/01 - Solid

Attach QC EPH 04/06/01 - Solid

## MA DEP EPH Method Statement:

The containers were:   X   Satisfactory,    Broken,    Leaking.

Were all QA/QC procedures required by the EPH Method followed?

Yes   X   No   

Were all performance/acceptance standards for the required QA/QC procedures achieved? Yes    No   X   (see comment above)

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes   X   No   

As required by the method, the following statements apply;

GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 13190.14

Work Order No.: 0104-00017

- 
1. The solvent extraction methods utilized have been demonstrated to achieve the required performance levels through the initial demonstration of capabilities study.
  2. Baseline blank correction is routinely performed.
  3. The C11-C22 aromatic range is corrected for the 17 target polynuclear aromatic hydrocarbons (PAHs).
  4. The reported surrogates are also the fractionation surrogates.

The signature of the report indicates the following attestation (as required by the MA DEP Method);

I attest under the pains and penalties of perjury, that based upon inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is to the best of my knowledge and belief, accurate and complete.

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GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 13190.14

Work Order No.: 0104-00017

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Data Authorized By: \_\_\_\_\_



% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Soil data is reported on a dry weight basis unless otherwise specified.

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.

Laboratory Identification Numbers:

MA: MA092      NH: 2028  
CT: PH0579  
NY: 11063      RI: A46

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

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GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
 QUALITY CONTROL SOLID

M E T H O D   B L A N K

DATE EXTRACTED: 04/05/01

DATE ANALYZED: 04/05/01

8082 COMPOUNDS POLYCHLORINATED BIPHENYLS	CONC. ug/L-PPB	QUANT. LIMIT ug/L-PPB
AROCLOR 1262	ND	5.0
AROCLOR 1260	ND	5.0
AROCLOR 1254	ND	5.0
AROCLOR 1248	ND	5.0
AROCLOR 1242/1016	ND	5.0
AROCLOR 1232	ND	10
AROCLOR 1221	ND	5.0

8082 SURROGATES	% RECOVERY	RECOV. LIMITS
TETRACHLORO-M-XYLENE	56.5	45-147
DECACHLOROBIPHENYL	59.5	27-138

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
Aroclor 1242	125	40-140	10.6	50



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 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02464  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

DATE: 4/6/01 G

**AQUEOUS**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		65-127		20
Trichloroethene		87-105		20
Toluene		86-105		20

**SOLID**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	104	70-130	1.19	35
Trichloroethene	107	70-130	0.91	35
Toluene	110	70-130	4.16	35

**METHOD BLANK**

TOTAL COMPOUNDS DETECTED	ND
--------------------------	----

SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4		80-114	112	80-120
Toluene-D8		88-110	94.5	81-117
4-Bromofluorobenzene		86-115	86.0	80-120

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 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX

QUALITY CONTROL

DATE: 4/9/01 G

AQUEOUS

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		65-127		20
Trichloroethene		87-105		20
Toluene		86-105		20

SOLID

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	98.0	70-130	13.1	35
Trichloroethene	98.5	70-130	12.3	35
Toluene	110	70-130	13.1	35

METHOD BLANK

TOTAL COMPOUNDS DETECTED	ND
--------------------------	----

SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4		80-114	109	80-120
Toluene-D8		88-110	96.3	81-117
4-Bromofluorobenzene		86-115	86.2	80-120

GZA GEOENVIRONMENTAL, INC.  
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 106 SOUTH STREET, HOPKINTON, MA 01748 (508) 435-9244  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 04/05/2001      Solid

METHOD BLANK	AQUEOUS ug/L-PPB	SOLID mg/kg - PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 ALIPHATICS	<50	<1.0
C19-C36 ALIPHATICS	<50	<1.0
C10-C22 AROMATICS	<100	<2.0
TOTAL UNWEIGHTED CONC.	<50	<1.0
<b>WEIGHTED CONC.</b>		
C9-C18 ALIPHATICS (0.05 MULT.)	<2.5	<0.05
C19-C36 ALIPHATICS (0.005 MULT.)	<0.25	<0.005
C10-C22 AROMATICS (1.0 MULT.)	<100	<2.0
TOTAL WEIGHTED CONC.	<0.25	<0.005
<b>TARGET COMPOUNDS</b>		
NAPHTHALENE	<10	<0.30
2-METHYLNAPHTHALENE	<10	<0.30
1-METHYLNAPHTHALENE	<10	<0.30
ACENAPHTHYLENE	<10	<0.30
ACENAPHTHENE	<10	<0.30
FLUORENE	<10	<0.30
PHENANTHRENE	<10	<0.30
ANTHRACENE	<10	<0.30
FLUORANTHENE	<10	<0.30
PYRENE	<10	<0.30
BENZO(a)ANTHRACENE	<10	<0.30
CHRYSENE	<10	<0.30
BENZO(b)FLUORANTHENE	<10	<0.30
BENZO(k)FLUORANTHENE	<10	<0.30
BENZO(a)PYRENE	<10	<0.30
INDENO(1,2,3-cd)PYRENE	<10	<0.30
DIBENZO(a,h)ANTHRACENE	<10	<0.30
BENZO(g,h,i)PERYLENE	<10	<0.30

SURROGATE	%RECOV.	LIMITS-AQ.	LIMITS-SOL.
***1-CHLORO-OCTADECANE (AL)	104	40-130	40-116
***p-TERPHENYL(AR)	82.7	50-123	50-135

MATRIX SPIKE/DUPLICATE SPIKE	RECOV.%	LIMITS-AQ.	LIMITS-SOL.
EICOSANE (AL) MS	106	40-130	40-116
EICOSANE (AL) MSD	94.1	40-130	40-116
EICOSANE % DIFFERENCE	11.9	35	45
FLUORANTHENE (AR) MS	95.1	50-123	50-135
FLUORANTHENE (AR) MSD	70.9	50-123	50-135
FLUORANTHENE % DIFFERENCE	29.1	35	45

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 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 04/06/2001      Solid

METHOD BLANK	AQUEOUS ug/L-PPB	SOLID mg/kg - PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 ALIPHATICS	<50	<1.0
C19-C36 ALIPHATICS	<50	<1.0
C10-C22 AROMATICS	<100	<2.0
TOTAL UNWEIGHTED CONC.	<50	<1.0
<b>WEIGHTED CONC.</b>		
C9-C18 ALIPHATICS (0.05 MULT.)	<2.5	<0.05
C19-C36 ALIPHATICS (0.005 MULT.)	<0.25	<0.005
C10-C22 AROMATICS (1.0 MULT.)	<100	<2.0
TOTAL WEIGHTED CONC.	<0.25	<0.005
<b>TARGET COMPOUNDS</b>		
NAPHTHALENE	<10	<0.30
2-METHYLNAPHTHALENE	<10	<0.30
1-METHYLNAPHTHALENE	<10	<0.30
ACENAPHTHYLENE	<10	<0.30
ACENAPHTHENE	<10	<0.30
FLUORENE	<10	<0.30
PHENANTHRENE	<10	<0.30
ANTHRACENE	<10	<0.30
FLUORANTHENE	<10	<0.30
PYRENE	<10	<0.30
BENZO(a)ANTHRACENE	<10	<0.30
CHRYSENE	<10	<0.30
BENZO(b)FLUORANTHENE	<10	<0.30
BENZO(k)FLUORANTHENE	<10	<0.30
BENZO(a)PYRENE	<10	<0.30
INDENO(1,2,3-cd)PYRENE	<10	<0.30
DIBENZO(a,h)ANTHRACENE	<10	<0.30
BENZO(g,h,i)PERYLENE	<10	<0.30

SURROGATE	%RECOV.	LIMITS-AQ.	LIMITS-SOL.
***1-CHLORO-OCTADECANE (AL)	81.5	40-130	40-116
***p-TERPHENYL(AR)	75.1	50-123	50-135

MATRIX SPIKE/DUPLICATE SPIKE	RECOV.%	LIMITS-AQ.	LIMITS-SOL.
EICOSANE (AL) MS	106	40-130	40-116
EICOSANE (AL) MSD	94.1	40-130	40-116
EICOSANE % DIFFERENCE	11.9	35	45
FLUORANTHENE (AR) MS	95.0	50-123	50-135
FLUORANTHENE (AR) MSD	70.9	50-123	50-135
FLUORANTHENE % DIFFERENCE	29.1	35	45

W.O. # 0104-00017  
(for lab use only)

[illegible]

W.O. # 0104-00017

(for lab use only)

**NOTES: Preservatives, special reporting limits, known contamination, etc.**

1. Metals = PP13 plus Aluminum, barium, and magnesium

NOTES: Preservatives, special reporting limits, known contamination, etc.:

1. Metals = PP13 plus Aluminum, barium, and magnesium

TUNAROUND TIME: Standard Rush X Days, Approved by: see Kate Walsh LAB USE: 1.5  
 °C TEMP. OF COOLER  
 GZA FILE NO: 1319014 P.O. NO. \_\_\_\_\_  
 PROJECT W/L Western Area  
 LOCATION W/L N. Grafton  
 COLLECTOR(S) TRB/JSL SHEET 2 OF 2

W.O. # 0104-00017  
(for lab use only)

[illegible]

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00031

Sample ID: G-SS4  
Sample Date: 4/04/2001

Sample No.: 004

Test Performed	Method	Results	Units	Tech	Analysis Date
Chlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,1,1,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/12/01
Ethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
m&p-Xylene	EPA 8260	< 100	ug/kg	NCS	4/12/01
o-Xylene	EPA 8260	< 100	ug/kg	NCS	4/12/01
Styrene	EPA 8260	< 100	ug/kg	NCS	4/12/01
Bromoform	EPA 8260	< 200	ug/kg	NCS	4/12/01
Isopropylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,2,3-Trichloropropane	EPA 8260	< 100	ug/kg	NCS	4/12/01
Bromobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
n-Propylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
2-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,3,5-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
4-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/12/01
tert-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,2,4-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
sec-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
p-Isopropyltoluene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,3-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,4-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
n-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,2-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 500	ug/kg	NCS	4/12/01
1,2,4-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
Hexachlorobutadiene	EPA 8260	< 100	ug/kg	NCS	4/12/01
Naphthalene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,2,3-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
Surrogates:	EPA 8260	< 100	ug/kg	NCS	4/12/01
***1,2-Dichloroethane-D4	EPA 8260	102	% R	NCS	4/12/01
***Toluene-D8	EPA 8260	100	% R	NCS	4/12/01
***4-Bromofluorobenzene	EPA 8260	98.1	% R	NCS	4/12/01
Preparation		20	DF	NCS	4/12/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/09/01
Aroclor 1262	EPA 8082	< 5.0	ug/kg	RJD	4/09/01
Aroclor 1260	EPA 8082	8.4	ug/kg	RJD	4/09/01
Aroclor 1254	EPA 8082	8.2	ug/kg	RJD	4/09/01
Aroclor 1248	EPA 8082	< 5.0	ug/kg	RJD	4/09/01
Aroclor 1242/1016	EPA 8082	< 5.0	ug/kg	RJD	4/09/01
Aroclor 1232	EPA 8082	< 5.0	ug/kg	RJD	4/09/01



## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00031

Sample ID: G-SS4  
Sample Date: 4/04/2001

Sample No.: 004

Test Performed	Method	Results	Units	Tech	Analysis Date
Aroclor 1221	EPA 8082	<5.0	ug/kg	RJD	4/09/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	43.4	* % R	RJD	4/09/01
***Decachlorobiphenyl	EPA 8082	50.4	% R	RJD	4/09/01
Extraction		0.2	DF	KJW	4/06/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/10/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	5.4	mg/kg	OMS	4/10/01
C9-C18 Aliphatic Fraction	MADEP	2.5	mg/kg	OMS	4/10/01
C19-C36 Aliphatic Fraction	MADEP	6.0	mg/kg	OMS	4/10/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	5.4	mg/kg	OMS	4/10/01
Surrogates:	MADEP			OMS	4/10/01
***1-Chlorooctadecane (aliphatic): 40-116 %R	MADEP	81.6	%R	OMS	4/10/01
***p-Terphenyl (aromatic): 50-135 %R	MADEP	72.4	%R	OMS	4/10/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	<0.30	mg/kg	OMS	4/10/01
2-Methylnaphthalene (Diesel PAH)	MADEP	<0.30	mg/kg	OMS	4/10/01
Acenaphthylene (Diesel PAH)	MADEP	<0.30	mg/kg	OMS	4/10/01
Acenaphthene (Diesel PAH)	MADEP	<0.30	mg/kg	OMS	4/10/01
Fluorene	MADEP	<0.30	mg/kg	OMS	4/10/01
Phenanthrene (Diesel PAH)	MADEP	<0.30	mg/kg	OMS	4/10/01
Anthracene	MADEP	<0.30	mg/kg	OMS	4/10/01
Fluoranthene	MADEP	<0.30	mg/kg	OMS	4/10/01
Pyrene	MADEP	<0.30	mg/kg	OMS	4/10/01
Benzo [a] Anthracene	MADEP	<0.30	mg/kg	OMS	4/10/01
Chrysene	MADEP	<0.30	mg/kg	OMS	4/10/01
Benzo [b] Fluoranthene	MADEP	<0.30	mg/kg	OMS	4/10/01
Benzo [k] Fluoranthene	MADEP	<0.30	mg/kg	OMS	4/10/01
Benzo [a] Pyrene	MADEP	<0.30	mg/kg	OMS	4/10/01
Indeno [1,2,3-cd] Pyrene	MADEP	<0.30	mg/kg	OMS	4/10/01
Dibenzo [a,h] Anthracene	MADEP	<0.30	mg/kg	OMS	4/10/01
Benzo [g,h,i] Perylene	MADEP	<0.30	mg/kg	OMS	4/10/01
Extraction	SONICATION	1.0	DF	AHW	4/09/01
Sample information can be found on the COC.					
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	12700	mg/Kg	BJP	4/17/01
Barium	EPA 6010	47.0	mg/Kg	BJP	4/17/01
Magnesium	EPA 6010	4470	mg/Kg	BJP	4/17/01
PRIORITY POLLUTANT METALS				BJP	4/17/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00031

Sample ID: G-SS5  
Sample Date: 4/04/2001

Sample No.: 005

Test Performed	Method	Results	Units	Tech	Analysis Date
Chlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,1,1,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/12/01
Ethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
m&p-Xylene	EPA 8260	< 100	ug/kg	NCS	4/12/01
o-Xylene	EPA 8260	< 100	ug/kg	NCS	4/12/01
Styrene	EPA 8260	< 100	ug/kg	NCS	4/12/01
Bromoform	EPA 8260	< 200	ug/kg	NCS	4/12/01
Isopropylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,2,3-Trichloropropane	EPA 8260	< 100	ug/kg	NCS	4/12/01
Bromobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
n-Propylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
2-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,3,5-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
4-Chlorotoluene	EPA 8260	< 100	ug/kg	NCS	4/12/01
tert-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,2,4-Trimethylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
sec-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
p-Isopropyltoluene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,3-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,4-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
n-Butylbenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,2-Dichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 500	ug/kg	NCS	4/12/01
1,2,4-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
Hexachlorobutadiene	EPA 8260	< 100	ug/kg	NCS	4/12/01
Naphthalene	EPA 8260	< 100	ug/kg	NCS	4/12/01
1,2,3-Trichlorobenzene	EPA 8260	< 100	ug/kg	NCS	4/12/01
Surrogates:	EPA 8260	< 100	ug/kg	NCS	4/12/01
***1,2-Dichloroethane-D4	EPA 8260	105	% R	NCS	4/12/01
***Toluene-D8	EPA 8260	100	% R	NCS	4/12/01
***4-Bromofluorobenzene	EPA 8260	95.1	% R	NCS	4/12/01
Preparation		20	DF	NCS	4/12/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/10/01
Aroclor 1262	EPA 8082	< 3000	ug/kg	RJD	4/10/01
Aroclor 1260	EPA 8082	< 3000	ug/kg	RJD	4/10/01
Aroclor 1254	EPA 8082	3200	ug/kg	RJD	4/10/01
Aroclor 1248	EPA 8082	< 3000	ug/kg	RJD	4/10/01
Aroclor 1242/1016	EPA 8082	< 3000	ug/kg	RJD	4/10/01
Aroclor 1232	EPA 8082	< 3000	ug/kg	RJD	4/10/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00031

Sample ID: G-SS5  
Sample Date: 4/04/2001

Sample No.: 005

Test Performed	Method	Results	Units	Tech	Analysis Date
Aroclor 1221	EPA 8082	< 3000	ug/kg	RJD	4/10/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	69.9	% R	RJD	4/10/01
***Decachlorobiphenyl	EPA 8082	81.6	% R	RJD	4/10/01
Extraction		120	DF	KJW	4/06/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/10/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	2.3	mg/kg	OMS	4/10/01
C9-C18 Aliphatic Fraction	MADEP	< 2.0	mg/kg	OMS	4/10/01
C19-C36 Aliphatic Fraction	MADEP	23	mg/kg	OMS	4/10/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	2.3	mg/kg	OMS	4/10/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116 %R	MADEP	91.8	%R	OMS	4/10/01
***p-Terphenyl (aromatic): 50-135 %R	MADEP	62.5	%R	OMS	4/10/01
TARGETED PAH ANALYTES					
Naphthalene (Diesel PAH)	MADEP				
2-Methylnaphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/10/01
Acenaphthylene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/10/01
Acenaphthene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/10/01
Fluorene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Phenanthrene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	4/10/01
Anthracene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Pyrene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Benzo [a] Anthracene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Chrysene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Benzo [b] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Benzo [k] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Benzo [a] Pyrene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Dibenzo [a,h] Anthracene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Benzo [g,h,i] Perylene	MADEP	< 0.30	mg/kg	OMS	4/10/01
Extraction	SONICATION	1.0	DF	AHW	4/09/01
Sample information can be found on the COC.					
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	12000	mg/Kg	BJP	4/17/01
Barium	EPA 6010	48.9	mg/Kg	BJP	4/17/01
Magnesium	EPA 6010	4620	mg/Kg	BJP	4/17/01
PRIORITY POLLUTANT METALS				BJP	4/17/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00031

Sample ID: PZ-4  
Sample Date: 4/04/2001

Sample No.: 016

Test Performed	Method	Results	Units	Tech	Analysis Date
1,1,1,2-Tetrachloroethane	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Ethylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
m&p-Xylene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
o-Xylene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Styrene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Bromoform	EPA 8260	< 2.0	ug/L	NCS	4/12/01
Isopropylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,2,3-Trichloropropane	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Bromobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
N-Propylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
2-Chlorotoluene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,3,5-Trimethylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
4-Chlorotoluene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
tert-Butylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,2,4-Trimethylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
sec-Butylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
p-Isopropyltoluene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,3-Dichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,4-Dichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
n-Butylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,2-Dichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 5.0	ug/L	NCS	4/12/01
1,2,4-Trichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Hexachlorobutadiene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Naphthalene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,2,3-Trichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Surrogates:	EPA 8260	< 1.0	ug/L	NCS	4/12/01
***1,2-Dichloroethane-D4	EPA 8260	93.7	% R	NCS	4/12/01
***Toluene-D8	EPA 8260	90.5	% R	NCS	4/12/01
***4-Bromofluorobenzene	EPA 8260	102	% R	NCS	4/12/01
Preparation		1.0	DF	NCS	4/12/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/10/01
Aroclor 1262	EPA 8082	< 0.20	ug/L	RJD	4/10/01
Aroclor 1260	EPA 8082	< 0.20	ug/L	RJD	4/10/01
Aroclor 1254	EPA 8082	< 0.20	ug/L	RJD	4/10/01
Aroclor 1248	EPA 8082	< 0.20	ug/L	RJD	4/10/01
Aroclor 1242/1016	EPA 8082	< 0.20	ug/L	RJD	4/10/01
Aroclor 1232	EPA 8082	< 0.20	ug/L	RJD	4/10/01
Aroclor 1221	EPA 8082	< 0.40	ug/L	RJD	4/10/01
	EPA 8082	< 0.20	ug/L	RJD	4/10/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00031

Sample ID: PZ-4  
Sample Date: 4/04/2001

Sample No.: 016

Test Performed	Method	Results	Units	Tech	Analysis Date
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	55.5	% R	RJD	4/10/01
***Decachlorobiphenyl	EPA 8082	81.8	% R	RJD	4/10/01
Extraction		1.0	DF	TLD	4/07/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/09/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	< 100	ug/L	OMS	4/09/01
C9-C18 Aliphatic Fraction	MADEP	< 100	ug/L	OMS	4/09/01
C19-C36 Aliphatic Fraction	MADEP	< 100	ug/L	OMS	4/09/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	< 100	ug/L	OMS	4/09/01
Surrogates:	MADEP			OMS	4/09/01
***1-Chlorooctadecane (aliphatic): 40-130 %R	MADEP	86.5	%R	OMS	4/09/01
***p-Terphenyl (aromatic): 50-123 %R	MADEP	75.2	%R	OMS	4/09/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/09/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/09/01
Acenaphthylene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/09/01
Acenaphthene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/09/01
Fluorene	MADEP	< 5.0	ug/L	OMS	4/09/01
Phenanthrene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/09/01
Anthracene	MADEP	< 5.0	ug/L	OMS	4/09/01
Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/09/01
Pyrene	MADEP	< 5.0	ug/L	OMS	4/09/01
Benzo [a] Anthracene	MADEP	< 5.0	ug/L	OMS	4/09/01
Chrysene	MADEP	< 5.0	ug/L	OMS	4/09/01
Benzo [b] Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/09/01
Benzo [k] Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/09/01
Benzo [a] Pyrene	MADEP	< 5.0	ug/L	OMS	4/09/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 5.0	ug/L	OMS	4/09/01
Dibenzo [a,h] Anthracene	MADEP	< 5.0	ug/L	OMS	4/09/01
Benzo [g,h,i] Perylene	MADEP	< 5.0	ug/L	OMS	4/09/01
Extraction	SOLVENT EXT.	1.0	DF	AHW	4/06/01
Sample information can be found on the COC.					
The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	0.184	mg/L	BJP	4/18/01
Barium	EPA 6010	0.0211	mg/L	BJP	4/18/01
Magnesium	EPA 6010	12.5	mg/L	BJP	4/18/01
PRIORITY POLLUTANT METALS					
Silver	EPA 6010	< 0.0130	mg/L	BJP	4/18/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 13190.14

Work Order No.: 0104-00031

Sample ID: PZ-5  
Sample Date: 4/04/2001

Sample No.: 017

Test Performed	Method	Results	Units	Tech	Analysis Date
1,1,1,2-Tetrachloroethane	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Ethylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
m&p-Xylene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
o-Xylene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Styrene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Bromoform	EPA 8260	< 2.0	ug/L	NCS	4/12/01
Isopropylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,1,2,2-Tetrachloroethane	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,2,3-Trichloropropane	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Bromobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
N-Propylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
2-Chlorotoluene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,3,5-Trimethylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
4-Chlorotoluene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
tert-Butylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,2,4-Trimethylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
sec-Butylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
p-Isopropyltoluene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,3-Dichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,4-Dichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
n-Butylbenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,2-Dichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
1,2-Dibromo-3-Chloropropane	EPA 8260	< 5.0	ug/L	NCS	4/12/01
1,2,4-Trichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Hexachlorobutadiene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Naphthalene	EPA 8260	1.1	ug/L	NCS	4/12/01
1,2,3-Trichlorobenzene	EPA 8260	< 1.0	ug/L	NCS	4/12/01
Surrogates:	EPA 8260			NCS	4/12/01
***1,2-Dichloroethane-D4	EPA 8260	97.9	% R	NCS	4/12/01
***Toluene-D8	EPA 8260	91.7	% R	NCS	4/12/01
***4-Bromofluorobenzene	EPA 8260	106	% R	NCS	4/12/01
Preparation		1.0	DF	NCS	4/12/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/10/01
Aroclor 1262	EPA 8082	< 0.50	ug/L	RJD	4/10/01
Aroclor 1260	EPA 8082	< 0.50	ug/L	RJD	4/10/01
Aroclor 1254	EPA 8082	0.70	ug/L	RJD	4/10/01
Aroclor 1248	EPA 8082	< 0.50	ug/L	RJD	4/10/01
Aroclor 1242/1016	EPA 8082	< 0.50	ug/L	RJD	4/10/01
Aroclor 1232	EPA 8082	< 1.0	ug/L	RJD	4/10/01
Aroclor 1221	EPA 8082	< 0.50	ug/L	RJD	4/10/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00031

Sample ID: PZ-5  
Sample Date: 4/04/2001

Sample No.: 017

Test Performed	Method	Results	Units	Tech	Analysis Date
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	55.8	% R	RJD	4/10/01
***Decachlorobiphenyl	EPA 8082	83.4	% R	RJD	4/10/01
Extraction		1.0	DF	TLD	4/07/01
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	4/09/01
Unadjusted C11-C22 Aromatic Fraction	MADEP	< 100	ug/L	OMS	4/09/01
C9-C18 Aliphatic Fraction	MADEP	< 100	ug/L	OMS	4/09/01
C19-C36 Aliphatic Fraction	MADEP	< 100	ug/L	OMS	4/09/01
C11-C22 Aromatics (excludes target PAHs)	MADEP	< 100	ug/L	OMS	4/09/01
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-130 %R	MADEP	101	%R	OMS	4/09/01
***p-Terphenyl (aromatic): 50-123 %R	MADEP	52.9	%R	OMS	4/09/01
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/09/01
2-Methylnaphthalene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/09/01
Acenaphthylene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/09/01
Acenaphthene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/09/01
Fluorene	MADEP	< 5.0	ug/L	OMS	4/09/01
Phenanthrene (Diesel PAH)	MADEP	< 5.0	ug/L	OMS	4/09/01
Anthracene	MADEP	< 5.0	ug/L	OMS	4/09/01
Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/09/01
Pyrene	MADEP	< 5.0	ug/L	OMS	4/09/01
Benzo [a] Anthracene	MADEP	< 5.0	ug/L	OMS	4/09/01
Chrysene	MADEP	< 5.0	ug/L	OMS	4/09/01
Benzo [b] Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/09/01
Benzo [k] Fluoranthene	MADEP	< 5.0	ug/L	OMS	4/09/01
Benzo [a] Pyrene	MADEP	< 5.0	ug/L	OMS	4/09/01
Indeno [1,2,3-cd] Pyrene	MADEP	< 5.0	ug/L	OMS	4/09/01
Dibenzo [a,h] Anthracene	MADEP	< 5.0	ug/L	OMS	4/09/01
Benzo [g,h,i] Perylene	MADEP	< 5.0	ug/L	OMS	4/09/01
Extraction	SOLVENT EXT.	1.0	DF	AHW	4/06/01
Sample information can be found on the COC. The method statement is on the final page.					
METALS					
Aluminum	EPA 6010	< 0.0860	mg/L	BJP	4/18/01
Barium	EPA 6010	0.0247	mg/L	BJP	4/18/01
Magnesium	EPA 6010	20.1	mg/L	BJP	4/18/01
PRIORITY POLLUTANT METALS					
Silver	EPA 6010	< 0.0130	mg/L	BJP	4/18/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00031

## PROJECT NARRATIVE:

## 1. Sample Receipt

The samples were received on 04/5/01 via    GZA courier,    EC,    FEDEX, or    x hand delivered.

The temperature of the    temperature blank,    x cooler air was 2.5 degrees C. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference, including methanol preservation of soil samples for volatile analyses (preparation method 5035).

## 2. EPA Method 8082

Attach QC 8082 04/06/01 - Aqueous

Attach QC 8082 04/06/01 - Solid

## 3. MADEP EPH

Attach QC EPH 04/06/01 - Aqueous

Attach QC EPH 04/09/01 - Solid

## MA DEP EPH Method Statement:

The containers were:    X    Satisfactory,    Broken,    Leaking.

Were all QA/QC procedures required by the EPH Method followed?

Yes    X    No   

Were all performance/acceptance standards for the required QA/QC procedures achieved? Yes    X    No   

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes    X    No   

As required by the method, the following statements apply;

1. The solvent extraction methods utilized have been demonstrated to achieve the required performance levels through the initial demonstration of capabilities study.
2. Baseline blank correction is routinely performed.
3. The C11-C22 aromatic range is corrected for the 17 target polynuclear aromatic hydrocarbons (PAHs).



GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00031

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4. The reported surrogates are also the fractionation surrogates.

The signature of the report indicates the following attestation (as required by the MA DEP Method);

I attest under the pains and penalties of perjury, that based upon inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is to the best of my knowledge and belief, accurate and complete.

4. EPA Method 8260

Attach QC 8260 04/12/01 - G  
Attach QC 8260 04/12/01 - S  
Attach QC 8260 04/13/01 - G  
Attach QC 8260 04/17/01 - G

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GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00031

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Data Authorized By: 

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Soil data is reported on a dry weight basis unless otherwise specified.

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.

Laboratory Identification Numbers:

MA: MA092      NH: 2028  
CT: PH0579  
NY: 11063      RI: A46

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

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GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
 QUALITY CONTROL SOLID

METHOD BLANK

DATE EXTRACTED: 04/06/01

DATE ANALYZED: 04/09/01

8082 COMPOUNDS POLYCHLORINATED BIPHENYLS	CONC. ug/L-PPB	QUANT. LIMIT ug/L-PPB
AROCLOR 1262	ND	5.0
AROCLOR 1260	ND	5.0
AROCLOR 1254	ND	5.0
AROCLOR 1248	ND	5.0
AROCLOR 1242/1016	ND	5.0
AROCLOR 1232	ND	10
AROCLOR 1221	ND	5.0

8082 SURROGATES	% RECOVERY	RECOV. LIMITS
TETRACHLORO-M-XYLENE	58.1	45-147
DECACHLOROBIPHENYL	65.2	27-138

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
Aroclor 1248	101	40-140	17.7	50

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 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
 QUALITY CONTROL AQUEOUS

METHOD BLANK

DATE EXTRACTED: 04/07/01

DATE ANALYZED: 04/09/01

8082 COMPOUNDS POLYCHLORINATED BIPHENYLS	CONC. ug/L-PPB	QUANT. LIMIT ug/L-PPB
AROCLOR 1262	ND	0.2
AROCLOR 1260	ND	0.2
AROCLOR 1254	ND	0.2
AROCLOR 1248	ND	0.2
AROCLOR 1242/1016	ND	0.2
AROCLOR 1232	ND	0.2
AROCLOR 1221	ND	0.2

8082 SURROGATES	% RECOVERY	RECOV. LIMITS
TETRACHLORO-M-XYLENE	57.6	20-106
DECACHLOROBIPHENYL	59.1	31-111

LABORATORY CONTROL SAMPLE / DUPLICATE

COMPOUND	LCS RECOVERY (%)	ACCEPTANCE LIMITS (%)	LCS DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
Aroclor 1248	91.1	40-140	4.37	50

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 106 SOUTH STREET, HOPKINTON, MA 01748 (508) 435-9244  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 4/6/2001      Aqueous

METHOD BLANK	AQUEOUS ug/L-PPB	SOLID mg/kg - PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 ALIPHATICS	<50	<1.0
C19-C36 ALIPHATICS	<50	<1.0
C10-C22 AROMATICS	<100	<2.0
TOTAL UNWEIGHTED CONC.	<50	<1.0
<b>WEIGHTED CONC.</b>		
C9-C18 ALIPHATICS (0.05 MULT.)	<2.5	<0.05
C19-C36 ALIPHATICS (0.005 MULT.)	<0.25	<0.005
C10-C22 AROMATICS (1.0 MULT.)	<100	<2.0
TOTAL WEIGHTED CONC.	<0.25	<0.005
<b>TARGET COMPOUNDS</b>		
NAPHTHALENE	<10	<0.30
2-METHYLNAPHTHALENE	<10	<0.30
1-METHYLNAPHTHALENE	<10	<0.30
ACENAPHTHYLENE	<10	<0.30
ACENAPHTHENE	<10	<0.30
FLUORENE	<10	<0.30
PHENANTHRENE	<10	<0.30
ANTHRACENE	<10	<0.30
FLUORANTHENE	<10	<0.30
PYRENE	<10	<0.30
BENZO(a)ANTHRACENE	<10	<0.30
CHRYSENE	<10	<0.30
BENZO(b)FLUORANTHENE	<10	<0.30
BENZO(k)FLUORANTHENE	<10	<0.30
BENZO(a)PYRENE	<10	<0.30
INDENO(1,2,3-cd)PYRENE	<10	<0.30
DIBENZO(a,h)ANTHRACENE	<10	<0.30
BENZO(g,h,i)PERYLENE	<10	<0.30

SURROGATE	%RECOV.	LIMITS-AQ.	LIMITS-SOL.
***1-CHLORO-OCTADECANE (AL)	104	40-130	40-116
***p-TERPHENYL(AR)	82.7	50-123	50-135

MATRIX SPIKE/DUPLICATE SPIKE	RECOV.%	LIMITS-AQ.	LIMITS-SOL.
EICOSANE (AL) MS	99.7	40-130	40-116
EICOSANE (AL) MSD	84.9	40-130	40-116
EICOSANE % DIFFERENCE	16.0	35	45
FLUORANTHENE (AR) MS	94.5	50-123	50-135
FLUORANTHENE (AR) MSD	77.3	50-123	50-135
FLUORANTHENE % DIFFERENCE	20.1	35	45

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 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 04/09/2001      Solid

METHOD BLANK	AQUEOUS ug/L-PPB	SOLID mg/kg - PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 ALIPHATICS	<50	<1.0
C19-C36 ALIPHATICS	<50	<1.0
C10-C22 AROMATICS	<100	<2.0
TOTAL UNWEIGHTED CONC.	<50	<1.0
<b>WEIGHTED CONC.</b>		
C9-C18 ALIPHATICS (0.05 MULT.)	<2.5	<0.05
C19-C36 ALIPHATICS (0.005 MULT.)	<0.25	<0.005
C10-C22 AROMATICS (1.0 MULT.)	<100	<2.0
TOTAL WEIGHTED CONC.	<0.25	<0.005
<b>TARGET COMPOUNDS</b>		
NAPHTHALENE	<10	<0.30
2-METHYLNAPHTHALENE	<10	<0.30
1-METHYLNAPHTHALENE	<10	<0.30
ACENAPHTHYLENE	<10	<0.30
ACENAPHTHENE	<10	<0.30
FLUORENE	<10	<0.30
PHENANTHRENE	<10	<0.30
ANTHRACENE	<10	<0.30
FLUORANTHENE	<10	<0.30
PYRENE	<10	<0.30
BENZO(a)ANTHRACENE	<10	<0.30
CHRYSENE	<10	<0.30
BENZO(b)FLUORANTHENE	<10	<0.30
BENZO(k)FLUORANTHENE	<10	<0.30
BENZO(a)PYRENE	<10	<0.30
INDENO(1,2,3-cd)PYRENE	<10	<0.30
DIBENZO(a,h)ANTHRACENE	<10	<0.30
BENZO(g,h,i)PERYLENE	<10	<0.30

SURROGATE	%RECOV.	LIMITS-AQ.	LIMITS-SOL.
***1-CHLORO-OCTADECANE (AL)	80.1	40-130	40-116
***p-TERPHENYL(AR)	51.8	50-123	50-135

MATRIX SPIKE/DUPLICATE SPIKE	RECOV.%	LIMITS-AQ.	LIMITS-SOL.
EICOSANE (AL) MS	101	40-130	40-116
EICOSANE (AL) MSD	130	40-130	40-116
EICOSANE % DIFFERENCE	25.4	35	45
FLUORANTHENE (AR) MS	76.2	50-123	50-135
FLUORANTHENE (AR) MSD	87.1	50-123	50-135
FLUORANTHENE % DIFFERENCE	13.4	35	45

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02464  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

DATE: 4/12/01 G

**AQUEOUS**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		65-127		20
Trichloroethene		87-105		20
Toluene		86-105		20

**SOLID**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	106	70-130	7.13	35
Trichloroethene	108	70-130	4.05	35
Toluene	111	70-130	1.89	35

**METHOD BLANK**

TOTAL COMPOUNDS DETECTED	ND
--------------------------	----

SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4		80-114	106	80-120
Toluene-D8		88-110	94.0	81-117
4-Bromofluorobenzene		86-115	95.0	80-120

GZA GEOENVIRONMENTAL, INC.  
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 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02464  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

DATE: 4/12/01 S

**AQUEOUS**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	116	65-127	5.04	20
Trichloroethene	101	87-105	6.52	20
Benzene	107	87-118	0.45	20

**SOLID**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		70-130		35
Trichloroethene		70-130		35
Toluene		70-130		35

**METHOD BLANK**

TOTAL COMPOUNDS DETECTED	ND
--------------------------	----

SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4	97.4	80-114		80-120
Toluene-D8	91.7	88-110		81-117
4-Bromofluorobenzene	91.2	86-115		80-120



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 MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

DATE: 4/13/01 G

**AQUEOUS**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		65-127		20
Trichloroethene		87-105		20
Toluene		86-105		20

**SOLID**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	100	70-130	0.08	35
Trichloroethene	104	70-130	1.01	35
Toluene	107	70-130	4.52	35

**METHOD BLANK**

TOTAL COMPOUNDS DETECTED	ND
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SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4		80-114	118	80-120
Toluene-D8		88-110	95.6	81-117
4-Bromofluorobenzene		86-115	98.5	80-120

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**EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

DATE: 4/17/01 G

**AQUEOUS**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	108	65-127	3.77	20
Benzene	107	87-118	0.47	20
Toluene	103	86-105	0.36	20

**SOLID**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		70-130		35
Trichloroethene		70-130		35
Toluene		70-130		35

**METHOD BLANK**

TOTAL COMPOUNDS DETECTED	ND
--------------------------	----

SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
1,2-Dichloroethane-D4	106	80-114		80-120
Toluene-D8	98.0	88-110		81-117
4-Bromofluorobenzene	88.6	86-115		80-120

## CHAIN-OF-CUSTODY RECORD

W.O. # 0104-00031  
(for lab use only)

Sample I.D.	Date/Time Sampled (Very Important)	Matrix A=Air S=Soil GW=Ground W. SW=Surface W. PW=Process W. DN=Dredge M. Other (Specify)	ANALYSIS REQUIRED				Total # of Cont.	Note #
			PH	Cond.	HNU	GC Screen (VDA)		
G-SS1	4/4/2001	S						
G-SS2								
G-SS3								
G-SS4								
G-SS5								
W7-SS1								
W16-SS1								
W16-SS2								
W16-SS3								
W17-SS1								
W17SS2								

RELINQUISHED BY: M. Sabharwal

RELINQUISHED BY:

RELINQUISHED BY:

RECEIVED BY: [Signature]

RECEIVED BY:

RECEIVED BY:

PROJECT MANAGER: TIM BRIGGS

EXT: 5824

**GZA GEOENVIRONMENTAL, INC.**  
**ENGINEERS AND SCIENTISTS**

320 Needham Street  
 NEWTON UPPER FALLS, MA 02464-1594  
 (617) 969-0050  
 FAX (617) 965-7769

TURNAROUND TIME: Standard Days, Approved by:

GZA FILE NO: 13190.14

PROJECT: WYMAN GORDON

LOCATION: NORTH GRAFTON

COLLECTOR(S): JASON LEIBMAN

LAB USE: TEMP. OF COOLER 2.5°C

P.O. NO.

SHEET 1 OF 2

NOTES: Preservatives, special reporting limits, known contamination, etc.:

metals PPM-13 + ALUMINUM, BARIUM, MANGANESE

for samples G-SS1, G-SS2, G-SS3, G-SS4, G-SS5, W7-SS1

metals for all samples beginning W16 & W17, TEST FOR BERYLLIUM ONLY

## CHAIN-OF-CUSTODY RECORD

W.O. # 0104-60031  
(for lab use only)

[illegible]

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

G.McBride

Project Name: Wyman-Gordon  
Project No.: 13190.14

Date Received: 4/20/01  
Date Reported: 4/24/01  
Work Order No.: 0104-00114

Sample ID: SB10  
Sample Date: 4/20/2001

Sample No.: 001

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		27.5	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/24/01
Aroclor 1262	EPA 8082	< 50000	ug/kg	RJD	4/24/01
Aroclor 1260	EPA 8082	< 50000	ug/kg	RJD	4/24/01
Aroclor 1254	EPA 8082	230000	ug/kg	RJD	4/24/01
Aroclor 1248	EPA 8082	< 50000	ug/kg	RJD	4/24/01
Aroclor 1242/1016	EPA 8082	< 50000	ug/kg	RJD	4/24/01
Aroclor 1232	EPA 8082	< 50000	ug/kg	RJD	4/24/01
Aroclor 1221	EPA 8082	< 50000	ug/kg	RJD	4/24/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	74.4	% R	RJD	4/24/01
***Decachlorobiphenyl	EPA 8082	84.4	% R	RJD	4/24/01
Extraction		8000	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB11  
 Sample Date: 4/20/2001

Sample No.: 002

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		39.4	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/23/01
Aroclor 1262	EPA 8082	< 2000	ug/kg	RJD	4/23/01
Aroclor 1260	EPA 8082	< 2000	ug/kg	RJD	4/23/01
Aroclor 1254	EPA 8082	5600	ug/kg	RJD	4/23/01
Aroclor 1248	EPA 8082	< 2000	ug/kg	RJD	4/23/01
Aroclor 1242/1016	EPA 8082	< 2000	ug/kg	RJD	4/23/01
Aroclor 1232	EPA 8082	< 2000	ug/kg	RJD	4/23/01
Aroclor 1221	EPA 8082	< 2000	ug/kg	RJD	4/23/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	72.2	% R	RJD	4/23/01
***Decachlorobiphenyl	EPA 8082	88.4	% R	RJD	4/23/01
Extraction		200	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB12  
 Sample Date: 4/20/2001

Sample No.: 003

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		30.0	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/24/01
Aroclor 1262	EPA 8082	< 200000	ug/kg	RJD	4/24/01
Aroclor 1260	EPA 8082	< 200000	ug/kg	RJD	4/24/01
Aroclor 1254	EPA 8082	710000	ug/kg	RJD	4/24/01
Aroclor 1248	EPA 8082	< 200000	ug/kg	RJD	4/24/01
Aroclor 1242/1016	EPA 8082	< 200000	ug/kg	RJD	4/24/01
Aroclor 1232	EPA 8082	< 200000	ug/kg	RJD	4/24/01
Aroclor 1221	EPA 8082	< 200000	ug/kg	RJD	4/24/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	71.4	% R	RJD	4/24/01
***Decachlorobiphenyl	EPA 8082	116	% R	RJD	4/24/01
Extraction		20000	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB13  
 Sample Date: 4/20/2001

Sample No.: 004

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		28.8	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/24/01
Aroclor 1262	EPA 8082	< 500000	ug/kg	RJD	4/24/01
Aroclor 1260	EPA 8082	< 500000	ug/kg	RJD	4/24/01
Aroclor 1254	EPA 8082	1100000	ug/kg	RJD	4/24/01
Aroclor 1248	EPA 8082	< 500000	ug/kg	RJD	4/24/01
Aroclor 1242/1016	EPA 8082	< 500000	ug/kg	RJD	4/24/01
Aroclor 1232	EPA 8082	< 500000	ug/kg	RJD	4/24/01
Aroclor 1221	EPA 8082	< 500000	ug/kg	RJD	4/24/01
Surrogates:	EPA 8082			RJD	4/24/01
***Tetrachloro-m-xylene	EPA 8082	71.6	% R	RJD	4/24/01
***Decachlorobiphenyl	EPA 8082	128	% R	RJD	4/24/01
Extraction		40000	DF	KJW	4/23/01



## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB14  
Sample Date: 4/20/2001

Sample No.: 005

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		31.3	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/23/01
Aroclor 1262	EPA 8082	< 4000	ug/kg	RJD	4/23/01
Aroclor 1260	EPA 8082	< 4000	ug/kg	RJD	4/23/01
Aroclor 1254	EPA 8082	8400	ug/kg	RJD	4/23/01
Aroclor 1248	EPA 8082	< 4000	ug/kg	RJD	4/23/01
Aroclor 1242/1016	EPA 8082	< 4000	ug/kg	RJD	4/23/01
Aroclor 1232	EPA 8082	< 4000	ug/kg	RJD	4/23/01
Aroclor 1221	EPA 8082	< 4000	ug/kg	RJD	4/23/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	64.8	% R	RJD	4/23/01
***Decachlorobiphenyl	EPA 8082	84.8	% R	RJD	4/23/01
Extraction		300	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB15  
 Sample Date: 4/20/2001

Sample No.: 006

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		50.7	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/23/01
Aroclor 1262	EPA 8082	< 130	ug/kg	RJD	4/23/01
Aroclor 1260	EPA 8082	< 130	ug/kg	RJD	4/23/01
Aroclor 1254	EPA 8082	160	ug/kg	RJD	4/23/01
Aroclor 1248	EPA 8082	< 130	ug/kg	RJD	4/23/01
Aroclor 1242/1016	EPA 8082	260	ug/kg	RJD	4/23/01
Aroclor 1232	EPA 8082	< 130	ug/kg	RJD	4/23/01
Aroclor 1221	EPA 8082	< 130	ug/kg	RJD	4/23/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	68.2	% R	RJD	4/23/01
***Decachlorobiphenyl	EPA 8082	101	% R	RJD	4/23/01
Extraction		5.0	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB16  
 Sample Date: 4/20/2001

Sample No.: 007

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		26.7	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/23/01
Aroclor 1262	EPA 8082	< 1500	ug/kg	RJD	4/23/01
Aroclor 1260	EPA 8082	1600	ug/kg	RJD	4/23/01
Aroclor 1254	EPA 8082	2200	ug/kg	RJD	4/23/01
Aroclor 1248	EPA 8082	< 1500	ug/kg	RJD	4/23/01
Aroclor 1242/1016	EPA 8082	< 1500	ug/kg	RJD	4/23/01
Aroclor 1232	EPA 8082	< 1500	ug/kg	RJD	4/23/01
Aroclor 1221	EPA 8082	< 1500	ug/kg	RJD	4/23/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	59.7	% R	RJD	4/23/01
***Decachlorobiphenyl	EPA 8082	68.0	% R	RJD	4/23/01
Extraction		60	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB17  
 Sample Date: 4/20/2001

Sample No.: 008

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		19.0	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/23/01
Aroclor 1262	EPA 8082	< 500	ug/kg	RJD	4/23/01
Aroclor 1260	EPA 8082	< 500	ug/kg	RJD	4/23/01
Aroclor 1254	EPA 8082	1100	ug/kg	RJD	4/23/01
Aroclor 1248	EPA 8082	< 500	ug/kg	RJD	4/23/01
Aroclor 1242/1016	EPA 8082	< 500	ug/kg	RJD	4/23/01
Aroclor 1232	EPA 8082	< 500	ug/kg	RJD	4/23/01
Aroclor 1221	EPA 8082	< 500	ug/kg	RJD	4/23/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	60.2	% R	RJD	4/23/01
***Decachlorobiphenyl	EPA 8082	70.7	% R	RJD	4/23/01
Extraction		40	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB18  
 Sample Date: 4/20/2001

Sample No.: 009

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		70.8	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/23/01
Aroclor 1262	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1260	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1254	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1248	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1242/1016	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1232	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1221	EPA 8082	< 10	ug/kg	RJD	4/23/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	65.7	% R	RJD	4/23/01
***Decachlorobiphenyl	EPA 8082	76.1	% R	RJD	4/23/01
Extraction		1.0	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB19  
 Sample Date: 4/20/2001

Sample No.: 010

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		73.0	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/23/01
Aroclor 1262	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1260	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1254	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1248	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1242/1016	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1232	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1221	EPA 8082	< 10	ug/kg	RJD	4/23/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	61.8	% R	RJD	4/23/01
***Decachlorobiphenyl	EPA 8082	69.8	% R	RJD	4/23/01
Extraction		1.0	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB20  
 Sample Date: 4/20/2001

Sample No.: 011

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		35.4	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/23/01
Aroclor 1262	EPA 8082	< 25	ug/kg	RJD	4/23/01
Aroclor 1260	EPA 8082	32	ug/kg	RJD	4/23/01
Aroclor 1254	EPA 8082	43	ug/kg	RJD	4/23/01
Aroclor 1248	EPA 8082	< 25	ug/kg	RJD	4/23/01
Aroclor 1242/1016	EPA 8082	< 25	ug/kg	RJD	4/23/01
Aroclor 1232	EPA 8082	< 25	ug/kg	RJD	4/23/01
Aroclor 1221	EPA 8082	< 25	ug/kg	RJD	4/23/01
Surrogates:	EPA 8082			RJD	4/23/01
***Tetrachloro-m-xylene	EPA 8082	60.4	% R	RJD	4/23/01
***Decachlorobiphenyl	EPA 8082	69.3	% R	RJD	4/23/01
Extraction		1.0	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB21  
 Sample Date: 4/20/2001

Sample No.: 012

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		42.0	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/23/01
Aroclor 1262	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1260	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1254	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1248	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1242/1016	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1232	EPA 8082	< 10	ug/kg	RJD	4/23/01
Aroclor 1221	EPA 8082	< 10	ug/kg	RJD	4/23/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	54.1	% R	RJD	4/23/01
***Decachlorobiphenyl	EPA 8082	67.5	% R	RJD	4/23/01
Extraction		1.0	DF	KJW	4/23/01



GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB22  
 Sample Date: 4/20/2001

Sample No.: 013

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		34.2	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/24/01
Aroclor 1262	EPA 8082	< 250	ug/kg	RJD	4/24/01
Aroclor 1260	EPA 8082	260	ug/kg	RJD	4/24/01
Aroclor 1254	EPA 8082	530	ug/kg	RJD	4/24/01
Aroclor 1248	EPA 8082	< 250	ug/kg	RJD	4/24/01
Aroclor 1242/1016	EPA 8082	< 250	ug/kg	RJD	4/24/01
Aroclor 1232	EPA 8082	< 250	ug/kg	RJD	4/24/01
Aroclor 1221	EPA 8082	< 250	ug/kg	RJD	4/24/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	63.8	% R	RJD	4/24/01
***Decachlorobiphenyl	EPA 8082	82.2	% R	RJD	4/24/01
Extraction		16	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB23  
 Sample Date: 4/20/2001

Sample No.: 014

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		40.4	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/24/01
Aroclor 1262	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1260	EPA 8082	11	ug/kg	RJD	4/24/01
Aroclor 1254	EPA 8082	15	ug/kg	RJD	4/24/01
Aroclor 1248	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1242/1016	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1232	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1221	EPA 8082	< 10	ug/kg	RJD	4/24/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	57.4	% R	RJD	4/24/01
***Decachlorobiphenyl	EPA 8082	66.6	% R	RJD	4/24/01
Extraction		1.0	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB24  
 Sample Date: 4/20/2001

Sample No.: 015

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		46.9	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/24/01
Aroclor 1262	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1260	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1254	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1248	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1242/1016	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1232	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1221	EPA 8082	< 10	ug/kg	RJD	4/24/01
Surrogates:	EPA 8082			RJD	4/24/01
***Tetrachloro-m-xylene	EPA 8082	60.1	% R	RJD	4/24/01
***Decachlorobiphenyl	EPA 8082	70.6	% R	RJD	4/24/01
Extraction		1.0	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0104-00114

Sample ID: SB25  
 Sample Date: 4/20/2001

Sample No.: 016

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		65.6	%	TAJ	4/24/01
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	4/24/01
Aroclor 1262	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1260	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1254	EPA 8082	12	ug/kg	RJD	4/24/01
Aroclor 1248	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1242/1016	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1232	EPA 8082	< 10	ug/kg	RJD	4/24/01
Aroclor 1221	EPA 8082	< 10	ug/kg	RJD	4/24/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	62.7	% R	RJD	4/24/01
***Decachlorobiphenyl	EPA 8082	73.1	% R	RJD	4/24/01
Extraction		1.0	DF	KJW	4/23/01

GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00114

PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 04/20/01 via \_\_GZA courier, \_\_EC, \_\_FEDEX, or \_x\_ hand delivered.

The temperature of the \_\_temperature blank, \_x\_ cooler air was 2.8 degrees C. No cooling materials were used. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference, including methanol preservation of soil samples for volatile analyses (preparation method 5035).

2. EPA Method 8082

Attach QC 8082 04/23/01 - Solid

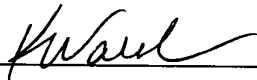
GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0104-00114

Data Authorized By: \_\_\_\_\_



% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Soil data is reported on a dry weight basis unless otherwise specified.

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.

Laboratory Identification Numbers:

MA: MA092    NH: 2028  
CT: PH0579  
NY: 11063    RI: A46

Please note that the laboratory signed copy of the chain of custody is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

**GZA GEOENVIRONMENTAL, INC.**  
**ENVIRONMENTAL CHEMISTRY LABORATORY**  
**106 SOUTH STREET, HOPKINTON, MA 01748**  
**MASSACHUSETTS LABORATORY I.D. NO. MA092**

**EPA METHOD 8082 ANALYSIS**  
**QUALITY CONTROL SOLID**

**METHOD BLANK**

**DATE EXTRACTED: 04/23/01**

**DATE ANALYZED: 04/23/01**

<b>8082 COMPOUNDS</b>	<b>CONC.</b>	<b>QUANT. LIMIT</b>
<b>POLYCHLORINATED BIPHENYLS</b>	<b>ug/L-PPB</b>	<b>ug/L-PPB</b>
AROCLOR 1262	ND	5.0
AROCLOR 1260	ND	5.0
AROCLOR 1254	ND	5.0
AROCLOR 1248	ND	5.0
AROCLOR 1242/1016	ND	5.0
AROCLOR 1232	ND	10
AROCLOR 1221	ND	5.0

<b>8082 SURROGATES</b>	<b>% RECOVERY</b>	<b>RECOV. LIMITS</b>
TETRACHLORO-M-XYLENE	60.7	45-147
DECACHLOROBIPHENYL	72.0	27-138

**MATRIX SPIKE / MATRIX SPIKE DUPLICATE**

<b>COMPOUND</b>	<b>MATRIX SPIKE RECOVERY (%)</b>	<b>ACCEPTANCE LIMITS (%)</b>	<b>DUPLICATE SPIKE DIFFERENCE (%)</b>	<b>ACCEPTANCE LIMITS (%)</b>
Aroclor 1248	114	40-140	4.48	50

**PINK COPY - Project Manager**

Sample I.D.	Date/Time Sampled (Very Important)	Matrix A-Air B-Soil C-Ground W. D-Water E-Other (specify)	ANALYSIS REQUIRED															Total # of Cont.	Note #						
			<input type="checkbox"/> pH	<input type="checkbox"/> Cond.	HNU	GC Screen (VOA) <input type="checkbox"/> 524.2 <input type="checkbox"/> 502.1	624 <input type="checkbox"/> 601 <input type="checkbox"/> 602	625	8280 8280-"8240" List	8021 8021-"8010" List	8021-"8020" List	8270 <input type="checkbox"/> PAH <input type="checkbox"/> A <input type="checkbox"/> BN	8062-PCBs Only	8061-Pest Only	TPH-GC (Mod. 8100)	TPH-GC w/FING	EPH (MA DEP)			VPH (MA DEP)	TCLP (Spec. Below)	Filtering (✓ if requested)	Metals <input type="checkbox"/> PPM-13 <input type="checkbox"/> R-B	Metals (List Below)	
SB10 *	4/20	S									X													1	
SB11 *											X													1	
SB12 *											X													1	
SB13 *											X													1	
SB14 *											X													1	
SB15 *											X													1	
SB16											X													1	
SB17											X													1	
SB18											X													1	
SB19											X													1	
SB20											X													1	

PRESERVATIVE (CI - HCl; MeOH, N - HNO<sub>3</sub>; S - H<sub>2</sub>SO<sub>4</sub>, Na - NaOH; O - Other) \* "

CONTAINER TYPE (P-Plastic, G-Glass, V-Vial, T-Teflon, O-Other)\* "

RELINQUISHED BY: DATE/TIME RECEIVED BY:

RELINQUISHED BY: 4/20 300 RECEIVED BY:

RELINQUISHED BY: DATE/TIME RECEIVED BY:

RELINQUISHED BY: DATE/TIME RECEIVED BY:

PROJECT MANAGER: G M Birdy EXT:

TURNAROUND TIME: Standard Rush Days Approved by: LAB USE: TEMP OF COOLER 3.0°C

GZA FILE NO: B3190.14 PROJECT W6 Westside PO. NO.

LOCATION Newington MA

COLLECTOR(S) Elephant Lee Fells SHEET 1 OF 2

NOTES: Preservatives, special reporting limits, known contamination, etc.:  
\* Hot up to 100° per Lab Rules



W.O. # 0104-00114  
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[illegible]

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

T.Briggs

Project Name: Wyman-Gordon  
Project No.: 13190.14

Date Received: 5/03/01  
Date Reported: 5/08/01  
Work Order No.: 0105-00023

Sample ID: G-TP5-S1  
Sample Date: 4/02/2001

Sample No.: 001

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/07/01
Aroclor 1262	EPA 8082	< 750000	ug/kg	RJD	5/07/01
Aroclor 1260	EPA 8082	1500000	ug/kg	RJD	5/07/01
Aroclor 1254	EPA 8082	< 750000	ug/kg	RJD	5/07/01
Aroclor 1248	EPA 8082	< 750000	ug/kg	RJD	5/07/01
Aroclor 1242/1016	EPA 8082	< 750000	ug/kg	RJD	5/07/01
Aroclor 1232	EPA 8082	< 750000	ug/kg	RJD	5/07/01
Aroclor 1221	EPA 8082	< 750000	ug/kg	RJD	5/07/01
Surrogates:	EPA 8082			RJD	5/07/01
***Tetrachloro-m-xylene	EPA 8082	63.9	% R	RJD	5/07/01
***Decachlorobiphenyl	EPA 8082	90.2	% R	RJD	5/07/01
Extraction		40000	DF	KJW	5/03/01
PERCENT SOLID		86.0	%	TAJ	5/08/01

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0105-00023

Sample ID: G-TP6-S2  
Sample Date: 4/02/2001

Sample No.: 002

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/07/01
Aroclor 1262	EPA 8082	< 100	ug/kg	RJD	5/07/01
Aroclor 1260	EPA 8082	270	ug/kg	RJD	5/07/01
Aroclor 1254	EPA 8082	< 100	ug/kg	RJD	5/07/01
Aroclor 1248	EPA 8082	< 100	ug/kg	RJD	5/07/01
Aroclor 1242/1016	EPA 8082	< 100	ug/kg	RJD	5/07/01
Aroclor 1232	EPA 8082	< 100	ug/kg	RJD	5/07/01
Aroclor 1221	EPA 8082	< 100	ug/kg	RJD	5/07/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	65.9	% R	RJD	5/07/01
***Decachlorobiphenyl	EPA 8082	71.3	% R	RJD	5/07/01
Extraction		4.0	DF	KJW	5/03/01
PERCENT SOLID		61.7	%	TAJ	5/08/01

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0105-00023

Sample ID: G-TP7-S2  
 Sample Date: 4/02/2001

Sample No.: 003

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/07/01
Aroclor 1262	EPA 8082	< 25	ug/kg	RJD	5/07/01
Aroclor 1260	EPA 8082	75	ug/kg	RJD	5/07/01
Aroclor 1254	EPA 8082	< 25	ug/kg	RJD	5/07/01
Aroclor 1248	EPA 8082	< 25	ug/kg	RJD	5/07/01
Aroclor 1242/1016	EPA 8082	< 25	ug/kg	RJD	5/07/01
Aroclor 1232	EPA 8082	< 25	ug/kg	RJD	5/07/01
Aroclor 1221	EPA 8082	< 25	ug/kg	RJD	5/07/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	82.3	% R	RJD	5/07/01
***Decachlorobiphenyl	EPA 8082	88.5	% R	RJD	5/07/01
Extraction		1.0	DF	KJW	5/03/01
PERCENT SOLID		82.1	%	TAJ	5/08/01

GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0105-00023

---

PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 04/3/01 via   x   GZA courier,    EC,  
   FEDEX, or    hand delivered.

Additional testing was requested by the PM on 5/2/01 and processed  
by the laboratory on 5/7/01.

The PM was informed that sample preparation and analysis will be  
completed outside the method specified holding time.

2. EPA Method 8082

Attach QC 8082 05/03/01 - Solid


GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0105-00023

---

Data Authorized By: 

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Soil data is reported on a dry weight basis unless otherwise specified.

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.

Laboratory Identification Numbers:

MA: MA092 NH: 2028  
CT: PH0579  
NY: 11063 RI: A46

Please note that the laboratory signed copy of the chain of custody is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
 QUALITY CONTROL SOLID

M E T H O D   B L A N K

DATE EXTRACTED: 05/03/01

DATE ANALYZED: 05/03/01

8082 COMPOUNDS POLYCHLORINATED BIPHENYLS	CONC. ug/L-PPB	QUANT. LIMIT ug/L-PPB
AROCLOR 1262	ND	5.0
AROCLOR 1260	ND	5.0
AROCLOR 1254	ND	5.0
AROCLOR 1248	ND	5.0
AROCLOR 1242/1016	ND	5.0
AROCLOR 1232	ND	10
AROCLOR 1221	ND	5.0

8082 SURROGATES	% RECOVERY	RECOV. LIMITS
TETRACHLORO-M-XYLENE	68.3	45-147
DECAChLOROBIPhENYL	83.7	27-138

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
Aroclor 1016	61.0	40-140	41.8	50

**PINK COPY - Project Manager**

0105-0003

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GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 13190.14

Work Order No.: 0105-00135

Sample ID: PZ-5  
 Sample Date: 5/16/2001

Sample No.: 004

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/24/01
Aroclor 1262	EPA 8082	<0.20	ug/L	RJD	5/24/01
Aroclor 1260	EPA 8082	<0.20	ug/L	RJD	5/24/01
Aroclor 1254	EPA 8082	<0.20	ug/L	RJD	5/24/01
Aroclor 1248	EPA 8082	<0.20	ug/L	RJD	5/24/01
Aroclor 1242/1016	EPA 8082	<0.20	ug/L	RJD	5/24/01
Aroclor 1232	EPA 8082	<0.40	ug/L	RJD	5/24/01
Aroclor 1221	EPA 8082	<0.20	ug/L	RJD	5/24/01
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	51.0	% R	RJD	5/24/01
***Decachlorobiphenyl	EPA 8082	71.7	% R	RJD	5/24/01
Extraction		1.0	DF	RJD	5/23/01

GZA GeoEnvironmental, Inc.  
ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0105-00135

---

PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 05/18/01 via ☒ GZA courier, ☐ EC, ☐ FEDEX, or ☐ hand delivered.

The temperature of the ☐ temperature blank, ☒ cooler air was 7.0 degrees C. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference, including methanol preservation of soil samples for volatile analyses (preparation method 5035).

2. MADEP EPH

Attach QC EPH 05/18/01 - Aqueous

MA DEP EPH Method Statement:

The containers were: ☒ Satisfactory, ☐ Broken, ☐ Leaking.

Were all QA/QC procedures required by the EPH Method followed?  
Yes ☒ No ☐

Were all performance/acceptance standards for the required QA/QC procedures achieved? Yes ☒ No ☐

Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes ☒ No ☐

As required by the method, the following statements apply;

1. The solvent extraction methods utilized have been demonstrated to achieve the required performance levels through the initial demonstration of capabilities study.
2. Baseline blank correction is routinely performed.
3. The C11-C22 aromatic range is corrected for the 17 target polynuclear aromatic hydrocarbons (PAHs).
4. The reported surrogates are also the fractionation surrogates.

The signature of the report indicates the following attestation (as required by the MA DEP Method);

---

GZA GeoEnvironmental, Inc.

ANALYTICAL REPORT

Project Name: Wyman-Gordon  
Project No.: 13190.14

Work Order No.: 0105-00135

---

I attest under the pains and penalties of perjury, that based upon inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is to the best of my knowledge and belief, accurate and complete.

3. EPA Method 8082

Attach QC 8082 05/23/01 - Aqueous

4. EPA Method 8260

Attach QC 8260 05/24/01 - G

Data Authorized By: 

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Soil data is reported on a dry weight basis unless otherwise specified.

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.

Laboratory Identification Numbers:

MA: MA092      NH: 2028  
CT: PH0579  
NY: 11063      RI: A46

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

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---

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748 (508) 435-9244  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 05/18/2001      Aqueous

<b>METHOD BLANK</b>	<b>AQUEOUS</b> ug/L-PPB	<b>SOLID</b> mg/kg · PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 ALIPHATICS	<50	<1.0
C19-C36 ALIPHATICS	<50	<1.0
C10-C22 AROMATICS	<100	<2.0
TOTAL UNWEIGHTED CONC.	<50	<1.0
<b>WEIGHTED CONC.</b>		
C9-C18 ALIPHATICS (0.05 MULT.)	<2.5	<0.05
C19-C36 ALIPHATICS (0.005 MULT.)	<0.25	<0.005
C10-C22 AROMATICS (1.0 MULT.)	<100	<2.0
TOTAL WEIGHTED CONC.	<0.25	<0.005
<b>TARGET COMPOUNDS</b>		
NAPHTHALENE	<10	<0.30
2-METHYLNAPHTHALENE	<10	<0.30
1-METHYLNAPHTHALENE	<10	<0.30
ACENAPHTHYLENE	<10	<0.30
ACENAPHTHENE	<10	<0.30
FLUORENE	<10	<0.30
PHENANTHRENE	<10	<0.30
ANTHRACENE	<10	<0.30
FLUORANTHENE	<10	<0.30
PYRENE	<10	<0.30
BENZO(a)ANTHRACENE	<10	<0.30
CHRYSENE	<10	<0.30
BENZO(b)FLUORANTHENE	<10	<0.30
BENZO(k)FLUORANTHENE	<10	<0.30
BENZO(a)PYRENE	<10	<0.30
INDENO(1,2,3-cd)PYRENE	<10	<0.30
DIBENZO(a,h)ANTHRACENE	<10	<0.30
BENZO(g,h,i)PERYLENE	<10	<0.30

<b>SURROGATE</b>	<b>%RECOV.</b>	<b>LIMITS-AQ.</b>	<b>LIMITS-SOL.</b>
<b>***1-CHLORO-OCTADECANE (AL)</b>	83.6	<b>40-130</b>	<b>40-116</b>
<b>***p-TERPHENYL(AR)</b>	91.8	<b>50-123</b>	<b>50-135</b>

<b>MATRIX SPIKE/DUPLICATE SPIKE</b>	<b>RECOV.%</b>	<b>LIMITS-AQ.</b>	<b>LIMITS-SOL.</b>
<b>EICOSANE (AL) MS</b>	76.6	<b>40-130</b>	<b>40-116</b>
<b>EICOSANE (AL) MSD</b>	73.3	<b>40-130</b>	<b>40-116</b>
<b>EICOSANE % DIFFERENCE</b>	4.40	<b>35</b>	<b>45</b>
<b>FLUORANTHENE (AR) MS</b>	73.6	<b>50-123</b>	<b>50-135</b>
<b>FLUORANTHENE (AR) MSD</b>	81.5	<b>50-123</b>	<b>50-135</b>
<b>FLUORANTHENE % DIFFERENCE</b>	10.2	<b>35</b>	<b>45</b>

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 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
 QUALITY CONTROL AQUEOUS

METHOD BLANK

DATE EXTRACTED: 05/23/01  
 DATE ANALYZED: 05/23/01

8082 COMPOUNDS POLYCHLORINATED BIPHENYLS	CONC. ug/L-PPB	QUANT. LIMIT ug/L-PPB
AROCLOR 1262	ND	0.2
AROCLOR 1260	ND	0.2
AROCLOR 1254	ND	0.2
AROCLOR 1248	ND	0.2
AROCLOR 1242/1016	ND	0.2
AROCLOR 1232	ND	0.2
AROCLOR 1221	ND	0.2

8082 SURROGATES	% RECOVERY	RECOV. LIMITS
TETRACHLORO-M-XYLENE	46.9	20-106
DECACHLOROBIPHENYL	41.2	31-111

LABORATORY CONTROL SAMPLE / DUPLICATE

COMPOUND	LCS RECOVERY (%)	ACCEPTANCE LIMITS (%)	LCS DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
Aroclor 1016	88.8	40-140	12.9	50

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 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02464  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 8260 ANALYSIS  
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

DATE: 5/24/01 G

**AQUEOUS**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene	102	65-127	4.90	20
Trichloroethene	98.8	87-105	2.00	20
Toluene	103	86-105	4.93	20

**SOLID**

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
1,1-Dichloroethene		70-130		35
Trichloroethene		70-130		35
Toluene		70-130		35

**METHOD BLANK**

TOTAL COMPOUNDS DETECTED	ND
--------------------------	----

SURROGATES	RECOVERY (%)	Aqueous LIMITS (%)	RECOVERY (%)	Solid LIMITS (%)
Dibromofluoromethane	101	80-120		80-120
Toluene-D8	93.0	88-110		81-117
4-Bromofluorobenzene	89.3	86-115		80-120

W.O. # 0105-00135  
(for lab use only)

[illegible]

**GZA GeoEnvironmental, Inc.**  
**106 South Street**  
**Hopkinton, MA 01748**  
**(781) 278-4700**

Laboratory Identification Numbers:  
MA: MA092 NH: 2028 RI: 236  
CT: PH0579 OK: 9928 NC: 615  
NY (NELAC): 11063

**A N A L Y T I C A L   D A T A   R E P O R T**

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062  
781-278-3700

Project No.: 01.0013190.24  
Work Order No.: 0305-00018  
Date Received: 5/05/03  
Date Reported: 5/13/03

**SAMPLE INFORMATION**

Date Sampled	Matrix	Laboratory ID	Sample ID
4/30/2003	Solid	0305-00018 001	W9-SS1 (0-1ft)
4/30/2003	Solid	0305-00018 002	W9-SS2 (0-1ft)
4/30/2003	Solid	0305-00018 003	W9-SS3 (0-1ft)
4/30/2003	Solid	0305-00018 004	W9-SS4 (0-1ft)
4/30/2003	Solid	0305-00018 005	W8-SS1 (0-1ft)
4/30/2003	Solid	0305-00018 006	SED 26C
4/30/2003	Solid	0305-00018 007	SED 27C
4/30/2003	Solid	0305-00018 008	SED 28C



GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Project Name: Wyman-Gordon  
Project No.: 01.0013190.24

Date Received: 5/05/03  
Date Reported: 5/13/03  
Work Order No.: 0305-00018

---

### PROJECT NARRATIVE:

#### 1. Sample Receipt

The samples were received on 05/2/03 via   x   GZA courier,    EC,    FEDEX, or    hand delivered.  
The temperature of the   x   temperature blank,    cooler air was 2.8 degrees C. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference.

The Chain of Custody has been modified to reflect new Project Numbers.

#### 2. EPA Method 8082

\* The elevated surrogate recovery is due to matrix interference from the concentration of PCB's present in the sample.

\*\* The sample contains a mixture of PCB congeners that are best represented by the two Aroclors reported.

Attach QC 8082 05/05/03 - Solid  
Attach QC 8082 05/08/03 - Solid

#### 3. EPA Method 6010/7471 - Metals

Attach QC 6010 05/05/03 - Solid  
Attach QC 6010 05/09/03 - Solid  
Attach QC Mercury 05/08/03 - Solid

#### 4. MADEP EPH

Attach QC EPH 05/06/03 - Solid

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Project Name: Wyman-Gordon  
Project No.: 01.0013190.24

Date Received: 5/05/03  
Date Reported: 5/13/03  
Work Order No.: 0305-00018

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### ANALYTICAL REPORT CERTIFICATION:

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Were all QA/QC procedures required for the specified analytical method(s) included in this report followed?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

---

Were all QA/QC performance standards for specified analytical methods(s) included in this report met (including those not required to be reported)?

Yes [ ☐ ] No [ ☒ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

---

Were all contaminants identified and quantified by the laboratory in the course of this analysis of field samples by comparison to a calibration standard, even if not a requested analyte, reported by the laboratory to the person that requested the analysis?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

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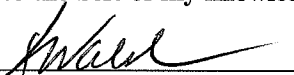
Were all samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

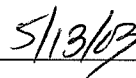
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I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: \_\_\_\_\_



Date: \_\_\_\_\_



Printed Name: Kathryn Walsh

Position: Laboratory Supervisor

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Project Name: Wyman-Gordon  
Project No.: 01.0013190.24

Date Received: 5/05/03  
Date Reported: 5/13/03  
Work Order No.: 0305-00018

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### LABORATORY STATEMENTS:

#### Abbreviations:

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

#### Method Key:

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.  
Method 6010: The current version of the method is 6010B.

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per method and are reported at the end of the analytical report if assigned on the Chain of Custody.

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 01.0013190.24

Work Order No.: 0305-00018

Sample ID: SED 26C  
 Sample Date: 4/30/2003

Sample No.: 006

Test Performed	Method	Results	Units	Tech	Analysis Date
Benzo [k] Fluoranthene	MADEP	< 0.30	mg/kg	OMS	5/09/03
Benzo [a] Pyrene	MADEP	< 0.30	mg/kg	OMS	5/09/03
Indeno [1,2,3-cd] Pyrene	MADEP	< 0.30	mg/kg	OMS	5/09/03
Dibenzo [a,h] Anthracene	MADEP	< 0.30	mg/kg	OMS	5/09/03
Benzo [g,h,i] Perylene	MADEP	< 0.30	mg/kg	OMS	5/09/03
Extraction	SONICATION	1.0	DF	ARL	5/06/03
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/08/03
Aroclor 1262	EPA 8082	< 5000	ug/kg	RJD	5/08/03
Aroclor 1260	EPA 8082	< 5000	ug/kg	RJD	5/08/03
Aroclor 1254	EPA 8082	16000	ug/kg	RJD	5/08/03
Aroclor 1248	EPA 8082	< 5000	ug/kg	RJD	5/08/03
Aroclor 1242/1016	EPA 8082	< 5000	ug/kg	RJD	5/08/03
Aroclor 1232	EPA 8082	< 5000	ug/kg	RJD	5/08/03
Aroclor 1221	EPA 8082	< 5000	ug/kg	RJD	5/08/03
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	92.3	% R	RJD	5/08/03
***Decachlorobiphenyl	EPA 8082	187	* % R	RJD	5/08/03
Extraction		200	DF	ARL	5/08/03
Barium	EPA 6010	170	mg/Kg	AJY	5/06/03
Aluminum	EPA 6010	38500	mg/Kg	AJY	5/06/03
Magnesium	EPA 6010	8670	mg/Kg	AJY	5/06/03

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 01.0013190.24

Work Order No.: 0305-00018

Sample ID: SED 27C  
 Sample Date: 4/30/2003

Sample No.: 007

Test Performed	Method	Results	Units	Tech	Analysis Date
Benzo [k] Fluoranthene	MADEP	< 0.60	mg/kg	OMS	5/10/03
Benzo [a] Pyrene	MADEP	< 0.60	mg/kg	OMS	5/10/03
Indeno [1,2,3-cd] Pyrene	MADEP	< 0.60	mg/kg	OMS	5/10/03
Dibenzo [a,h] Anthracene	MADEP	< 0.60	mg/kg	OMS	5/10/03
Benzo [g,h,i] Perylene	MADEP	< 0.60	mg/kg	OMS	5/10/03
Extraction	SONICATION	5.0	DF	ARL	5/06/03
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/08/03
Aroclor 1262	EPA 8082	< 63000	ug/kg	RJD	5/08/03
Aroclor 1260	EPA 8082	< 63000	ug/kg	RJD	5/08/03
Aroclor 1254	EPA 8082	1800000	ug/kg	RJD	5/08/03
Aroclor 1248	EPA 8082	< 63000	ug/kg	RJD	5/08/03
Aroclor 1242/1016	EPA 8082	< 63000	ug/kg	RJD	5/08/03
Aroclor 1232	EPA 8082	< 63000	ug/kg	RJD	5/08/03
Aroclor 1221	EPA 8082	< 63000	ug/kg	RJD	5/08/03
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	108	% R	RJD	5/08/03
***Decachlorobiphenyl	EPA 8082	196	* % R	RJD	5/08/03
Extraction		2500	DF	ARL	5/08/03
Barium	EPA 6010	103	mg/Kg	AJY	5/06/03
Aluminum	EPA 6010	25000	mg/Kg	AJY	5/06/03
Magnesium	EPA 6010	4020	mg/Kg	AJY	5/06/03

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 01.0013190.24

Work Order No.: 0305-00018

Sample ID: SED 28C  
 Sample Date: 4/30/2003

Sample No.: 008

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		41.2	%	CTG	5/06/03
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/06/03
Aroclor 1262	EPA 8082	< 50000	ug/kg	RJD	5/06/03
Aroclor 1260	EPA 8082	< 50000	ug/kg	RJD	5/06/03
Aroclor 1254	EPA 8082	120000	ug/kg	RJD	5/06/03
Aroclor 1248	EPA 8082	< 50000	ug/kg	RJD	5/06/03
Aroclor 1242/1016	EPA 8082	< 50000	ug/kg	RJD	5/06/03
Aroclor 1232	EPA 8082	< 50000	ug/kg	RJD	5/06/03
Aroclor 1221	EPA 8082	< 50000	ug/kg	RJD	5/06/03
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	115	% R	RJD	5/06/03
***Decachlorobiphenyl	EPA 8082	193	* % R	RJD	5/06/03
Extraction		3000	DF	RJD	5/05/03

**GZA GEOENVIRONMENTAL, INC.**  
**ENVIRONMENTAL CHEMISTRY LABORATORY**  
**106 SOUTH STREET, HOPKINTON, MA 01748**  
**MASSACHUSETTS LABORATORY I.D. NO. MA092**

**EPA METHOD 8082 ANALYSIS**  
**QUALITY CONTROL SOLID**

**DATE EXTRACTED: 05/05/03**

**DATE ANALYZED: 05/06/03**

<b>METHOD BLANK</b>	<b>Concentration</b>	<b>Quantitation Limit</b>
<b>POLYCHLORINATED BIPHENYLS as AROCLORS</b>	<b>ug/kg-PPB</b>	<b>ug/kg-PPB</b>
Aroclor 1262	ND	5.0
Aroclor 1260	ND	5.0
Aroclor 1254	ND	5.0
Aroclor 1248	ND	5.0
Aroclor 1242/1016	ND	5.0
Aroclor 1232	ND	5.0
Aroclor 1221	ND	5.0
<b>Surrogates:</b>		
Tetrachloro-m-xylene	96.7	30-150
Decachlorobiphenyl	117	30-150

<b>LABORATORY CONTROL SAMPLE (LCS)</b>	<b>% Recovery</b>	<b>Acceptance Limits</b>
Aroclor 1016	77.1	40-140
Aroclor 1260	116	40-140
<b>Surrogates:</b>		
Tetrachloro-m-xylene	94.6	30-150
Decachlorobiphenyl	114	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

**GZA GEOENVIRONMENTAL, INC.**  
**ENVIRONMENTAL CHEMISTRY LABORATORY**  
**106 SOUTH STREET, HOPKINTON, MA 01748**  
**MASSACHUSETTS LABORATORY I.D. NO. MA092**

**EPA METHOD 8082 ANALYSIS**  
**QUALITY CONTROL SOLID**

**DATE EXTRACTED: 05/08/03**

**DATE ANALYZED: 05/08/03**

<b>METHOD BLANK</b>	<b>Concentration</b>	<b>Quantitation Limit</b>
<b>POLYCHLORINATED BIPHENYLS as AROCLORS</b>	<b>ug/kg-PPB</b>	<b>ug/kg-PPB</b>
Aroclor 1262	ND	5.0
Aroclor 1260	ND	5.0
Aroclor 1254	ND	5.0
Aroclor 1248	ND	5.0
Aroclor 1242/1016	ND	5.0
Aroclor 1232	ND	5.0
Aroclor 1221	ND	5.0
<b>Surrogates:</b>		
Tetrachloro-m-xylene	87.2	30-150
Decachlorobiphenyl	107	30-150

<b>LABORATORY CONTROL SAMPLE (LCS)</b>	<b>% Recovery</b>	<b>Acceptance Limits</b>
Aroclor 1016	88.1	40-140
Aroclor 1260	104	40-140
<b>Surrogates:</b>		
Tetrachloro-m-xylene	81.6	30-150
Decachlorobiphenyl	101	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.



GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 6010B ANALYSIS**  
**Metals by ICP**

**QUALITY CONTROL - SOLID**

**DATE PREPARED: 05/06/2003**

QC Sample	Method Blank	Lab Control Sample
Units	mg/kg	% Recovery
Acceptance Limits	Results	80-120 %
<b>Analyte</b>		
Silver (Ag)	<0.500	89.4
Aluminum (Al)	<2.500	96.1
Arsenic (As)	<1.000	91.1
Boron (B)	NA	NA
Barium (Ba)	<0.500	95.6
Beryllium (Be)	<0.500	92.5
Calcium (Ca)	NA	NA
Cadmium (Cd)	<0.500	93.2
Cobalt (Co)	NA	NA
Chromium (Cr)	<0.500	96.4
Copper (Cu)	<1.500	110
Iron (Fe)	NA	NA
Magnesium (Mg)	<2.500	95.8
Manganese (Mn)	NA	NA
Molybdenum (Mo)	NA	NA
Nickel (Ni)	<1.000	95.7
Lead (Pb)	<1.000	94.9
Antimony (Sb)	<2.500	86.4
Selenium (Se)	<2.500	88.4
Strontium (Sr)	NA	NA
Titanium (Ti)	NA	NA
Thallium (Tl)	<2.500	90.0
Vanadium (V)	NA	NA
Zinc (Zn)	<1.000	95.3
Zirconium (Zr)	NA	NA

Matrix Spike / Duplicate Spike performed as per method and  
reported if assigned on Chain of Custody.

GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 6010B ANALYSIS  
Metals by ICP

QUALITY CONTROL - SOLID

DATE PREPARED: 5/9/03

QC Sample	Method Blank	Lab Control Sample
Units	mg/kg	% Recovery
Acceptance Limits	Results	80-120 %
<b>Analyte</b>		
Silver (Ag)	<0.500	85.7
Aluminum (Al)	NA	NA
Arsenic (As)	<1.000	90.4
Boron (B)	NA	NA
Barium (Ba)	<0.500	93.8
Beryllium (Be)	<0.500	92.0
Calcium (Ca)	NA	NA
Cadmium (Cd)	<0.500	92.6
Cobalt (Co)	NA	NA
Chromium (Cr)	<0.500	94.9
Copper (Cu)	<1.500	118
Iron (Fe)	NA	NA
Magnesium (Mg)	NA	NA
Manganese (Mn)	NA	NA
Molybdenum (Mo)	NA	NA
Nickel (Ni)	<1.000	94.1
Lead (Pb)	<1.000	93.8
Antimony (Sb)	<2.500	86.1
Selenium (Se)	<2.500	87.7
Strontium (Sr)	NA	NA
Titanium (Ti)	NA	NA
Thallium (Tl)	<2.500	89.3
Vanadium (V)	NA	NA
Zinc (Zn)	<1.000	96.9
Zirconium (Zr)	NA	NA

Matrix Spike / Duplicate Spike performed as per method and  
reported if assigned on Chain of Custody.

GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 7470/7471 ANALYSIS**  
**Mercury by Cold Vapor Atomic Absorption**

**QUALITY CONTROL - SOLID**

**Date Analyzed: 5/8/03**

QC Sample	Method Blank	Lab Control Sample
Units	mg/L	% Recovery
Acceptance Limits	Results	80-120%
Analyte		
Mercury (Hg)	<0.040 (solid)	105

Matrix Spike / Duplicate Spike performed as per method  
reported if assigned on Chain of Custody.

**MADEP EPH**  
**EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 5/6/2003

Solid

METHOD BLANK	AQUEOUS	SOLID	
	ug/L-PPB	mg/kg - PPM	
<b>UNWEIGHTED CONC.</b>			
C9-C18 Aliphatics	<100	<1.0	
C19-C36 Aliphatics	<100	<1.0	
C10-C22 Aromatics	<100	<2.0	
C10-C22 Aromatics (adjusted)	<100	<1.0	
<b>TARGET COMPOUNDS</b>			
Naphthalene	<5.0	<0.30	
2-Methylnaphthalene	<5.0	<0.30	
Acenaphthylene	<5.0	<0.30	
Acenaphthene	<5.0	<0.30	
Fluorene	<5.0	<0.30	
Phenanthrene	<5.0	<0.30	
Anthracene	<5.0	<0.30	
Fluoranthene	<5.0	<0.30	
Pyrene	<5.0	<0.30	
Benzo(a)anthracene	<5.0	<0.30	
Chrysene	<5.0	<0.30	
Benzo(b)fluoranthene	<5.0	<0.30	
Benzo(k)fluoranthene	<5.0	<0.30	
Benzo(a)pyrene	<5.0	<0.30	
Indeno(1,2,3-c,d)pyrene	<5.0	<0.30	
Dibenzo(a,h)anthracene	<5.0	<0.30	
Benzo(g,h,i)perylene	<5.0	<0.30	
<b>Surrogate:</b>	<b>Recovery (%)</b>	<b>Limits-Aqueous</b>	<b>Limits-Solid</b>
***1-Chlorooctadecane (Aliphatic)	73.1	40-130	40-116
***p-Terphenyl (Aromatic)	62.5	40-123	40-135
<b>LABORATORY CONTROL SAMPLE</b>			
	<b>Recovery (%)</b>	<b>Limits-Aqueous</b>	<b>Limits-Solid</b>
<b>Aliphatics:</b>			
Decane	58.6	40-140	40-140
Tetradecane	62.1	40-140	40-140
Octadecane	68.1	40-140	40-140
Tetracosane	80.9	40-140	40-140
Octacosane	77.4	40-140	40-140
<b>Aromatics:</b>			
2-Methylnaphthalene	47.8	40-140	40-140
Phenanthrene	78.3	40-140	40-140
Fluoranthene	80.3	40-140	40-140
Chrysene	80.6	40-140	40-140
Benzo(a)pyrene	84.6	40-140	40-140
<b>Surrogate:</b>	<b>Recovery (%)</b>	<b>Limits-Aqueous</b>	<b>Limits-Solid</b>
***1-Chlorooctadecane (Aliphatic)	75.9	40-130	40-116
***p-Terphenyl (Aromatic)	75.5	40-123	40-135

# CHAIN-OF-CUSTODY RECORD

W.O. # 0305-0001B  
(for lab use only)

Sample ID.	Date/Time Sampled (Very Important)	Matrix As-Air Soil City-Ground W. SW-Surface W. WW-Water W. DWC-Drinking W. Other (Specify)	WAF ONLY														ANALYSIS REQUIRED										Total # of Cont.	Note #		
			Dph Q Cond.	Cc Screen (VGA)	C6242 C6242	824	C6241 C6242	825	Formaldehyde	8260	8271	8271 - 8070 List	8271 - 8070 List	8270 EPA EPAH CBH	8052-PCBs Only	8081 - Pest Only	TPH-GC (Met. 8100)	TPH-GC w/PCB	EPH (MA DEP)	WPH (MA DEP)	TCF (Spec. Below)	Relating 1 of 2 required	Metals (EPA-13 13 P-3)	Metals (List Below)	Hardness					
P2-B	4/30/03	GLW																										1	1	
SW-5B		SW																										1	1.2	
SW-6C		SW																										1	1.2	
WQ-SS1 (0-1')		Soil																										1	1	
WQ-SS2 (0-1')																												1	1	
WQ-SS3 (0-1')																												1	1	
WQ-SS4 (0-1')																												1	1	
WQ-SS1 (0-1')																												1	1	
SED 26C		Sediment																										2	2	
SED 22C																												2	2	
SED 28C																												2	2	
PRESERVATIVE (Cl - HCl, M-HClOH, N - HNO3, S - H2SO4, Na - NaOH, O - Other)*																														

PRESERVATIVE (C) - HCl, MeMeOH, N - HNO3, S - H2SO4, Na - NaOH, O - Other

CONTAINER TYPE (P-Plastic, G-Glass, V-Vial, O-Other)

RECEIVED BY: 5-2-03 Paul Cusack 1400

DATE/TIME RECEIVED BY: 5/11/03 Paul Cusack 1400

DATE/TIME RECEIVED BY: 5-2-03 Paul Cusack 1400

DATE/TIME RECEIVED BY: 5-2-03 Paul Cusack 1400

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DATE/TIME RECEIVED BY: 5-2-03 Paul Cusack 1400

PROJECT MANAGER: Tim Briggs EXT: MA  
DATA REPORT ☒ PDF (Adobe) ☐ ASCII ☐ EXCEL Specify State

GZA GEOENVIRONMENTAL, INC.  
ENGINEERS AND SCIENTISTS  
106 South Street  
Hopkinton, MA 01748  
(508) 435-9244  
FAX (508) 435-9912

NOTES: Preservatives, special reporting limits, known contamination, additional testing parameters, etc.:  
1. Samples were field packed.  
2. Need low metals for metals to meet Aque in surface water, please contact Tim Briggs with questions.  
3. Nickel & Zinc Analysis.  
4. Copper, Nickel, Zinc, Lead, Hardness Analysis.  
5. PPHs, Aluminum, Barium, Magnesium Analysis.

TURNAROUND TIME (Standard) Rush Days, Approved by: LAB USE: TEMP. OF COOLER 2.8 °C

GZA FILE NO: 01.00 13190.00 P.O. NO.

PROJECT Wyman-Gordon

LOCATION Grafton, MA

COLLECTORS) CWD SHEET 1 OF 1



GZA-P003

**GZA GeoEnvironmental, Inc.**  
**106 South Street**  
**Hopkinton, MA 01748**  
**(781) 278-4700**

Laboratory Identification Numbers:  
MA: MA092 NH: 2028 RI: 236  
CT: PH0579 OK: 9928 NC: 615  
NY (NELAC): 11063

**A N A L Y T I C A L   D A T A   R E P O R T**

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608  
(508)755-1700  
T. Briggs

Project No.: 11.0013190.24  
Work Order No.: 0305-00080  
Date Received: 5/12/03  
Date Reported: 5/20/03

**SAMPLE INFORMATION**

Date Sampled	Matrix	Laboratory ID	Sample ID
5/06/2003	Solid	0305-00080 001	G-TP12-S1
5/06/2003	Solid	0305-00080 002	W6-TP3-S2
5/06/2003	Solid	0305-00080 003	W6-TP3-S3
5/06/2003	Solid	0305-00080 004	W9-TP16-S3
5/06/2003	Solid	0305-00080 005	W9-TP17-S2
5/06/2003	Solid	0305-00080 006	W10-TP4-S1
5/06/2003	Solid	0305-00080 007	W10-TP5-S1
5/06/2003	Solid	0305-00080 008	W10-TP6-S1

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

T. Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 5/12/03  
Date Reported: 5/20/03  
Work Order No.: 0305-00080

---

### PROJECT NARRATIVE:

#### 1. Sample Receipt

The samples were received on 05/12/03 via   x   GZA courier,   EC,   FEDEX, or   hand delivered. The temperature of the   x   temperature blank,   cooler air was 6.1 degrees C. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference.

The Chain of Custody has been modified to reflect new Project Numbers.

#### 2. EPA Method 8082 - PCB's

\* The samples indicate the presence of more than one Aroclor product. The PCB concentrations are estimates as some PCB congeners are contained in more than one Aroclor mixture.

Attach QC 05/13/03 - Solid

#### 3. EPA Method 6010/7471 - Metals

Attach QC 6010 05/13/03 - Solid

Attach QC Mercury 05/19/03 - Solid

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

T. Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 5/12/03  
Date Reported: 5/20/03  
Work Order No.: 0305-00080

---

### ANALYTICAL REPORT CERTIFICATION:

---

Were all QA/QC procedures required for the specified analytical method(s) included in this report followed?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

---

Were all QA/QC performance standards for specified analytical methods(s) included in this report met (including those not required to be reported)?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

---

Were all contaminants identified and quantified by the laboratory in the course of this analysis of field samples by comparison to a calibration standard, even if not a requested analyte, reported by the laboratory to the person that requested the analysis?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

---

Were all samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

---

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Printed Name: Kathryn Walsh

Position: Laboratory Supervisor



GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

T. Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 5/12/03  
Date Reported: 5/20/03  
Work Order No.: 0305-00080

---

### LABORATORY STATEMENTS:

#### Abbreviations:

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

#### Method Key:

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.  
Method 6010: The current version of the method is 6010B.

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per method and are reported at the end of the analytical report if assigned on the Chain of Custody.

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0305-00080

Sample ID: W10-TP5-S1  
 Sample Date: 5/06/2003

Sample No.: 007

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		70.7	%	CTG	5/14/03
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/15/03
Aroclor 1262	EPA 8082	<50	ug/kg	RJD	5/15/03
Aroclor 1260	EPA 8082	<50	ug/kg	RJD	5/15/03
Aroclor 1254	EPA 8082	<50	ug/kg	RJD	5/15/03
Aroclor 1248	EPA 8082	<50	ug/kg	RJD	5/15/03
Aroclor 1242/1016	EPA 8082	<50	ug/kg	RJD	5/15/03
Aroclor 1232	EPA 8082	<50	ug/kg	RJD	5/15/03
Aroclor 1221	EPA 8082	<50	ug/kg	RJD	5/15/03
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	51.9	% R	RJD	5/15/03
***Decachlorobiphenyl	EPA 8082	112	% R	RJD	5/15/03
Extraction		4.0	DF	ARL	5/13/03
PRIORITY POLLUTANT METALS				AJY	5/14/03
Beryllium	EPA 6010	<0.272	mg/Kg	AJY	5/14/03
Silver	EPA 6010	<0.272	mg/Kg	AJY	5/14/03
Arsenic	EPA 6010	30.4	mg/Kg	AJY	5/16/03
Cadmium	EPA 6010	<0.272	mg/Kg	AJY	5/16/03
Chromium	EPA 6010	18.2	mg/Kg	AJY	5/14/03
Copper	EPA 6010	14.4	mg/Kg	AJY	5/16/03
Mercury	EPA 7471A	0.0486	mg/Kg	TLD	5/19/03
Nickel	EPA 6010	12.9	mg/Kg	AJY	5/14/03
Lead	EPA 6010	18.7	mg/Kg	AJY	5/16/03
Antimony	EPA 6010	<1.36	mg/Kg	AJY	5/16/03
Selenium	EPA 6010	<1.36	mg/Kg	AJY	5/16/03
Thallium	EPA 6010	<1.36	mg/Kg	AJY	5/16/03
Zinc	EPA 6010	40.3	mg/Kg	AJY	5/16/03
Aluminum	EPA 6010	18200	mg/Kg	AJY	5/14/03
Barium	EPA 6010	34.5	mg/Kg	AJY	5/14/03
Magnesium	EPA 6010	2680	mg/Kg	AJY	5/14/03

**GZA GEOENVIRONMENTAL, INC.**  
**ENVIRONMENTAL CHEMISTRY LABORATORY**  
**106 SOUTH STREET, HOPKINTON, MA 01748**  
**MASSACHUSETTS LABORATORY I.D. NO. MA092**

**EPA METHOD 8082 ANALYSIS**  
**QUALITY CONTROL SOLID**

**DATE EXTRACTED: 05/13/03**

**DATE ANALYZED: 05/13/03**

<b>METHOD BLANK</b>	<b>Concentration</b>	<b>Quantitation Limit</b>
<b>POLYCHLORINATED BIPHENYLS as AROCLORS</b>	<b>ug/kg-PPB</b>	<b>ug/kg-PPB</b>
Aroclor 1262	ND	5.0
Aroclor 1260	ND	5.0
Aroclor 1254	ND	5.0
Aroclor 1248	ND	5.0
Aroclor 1242/1016	ND	5.0
Aroclor 1232	ND	5.0
Aroclor 1221	ND	5.0
<b>Surrogates:</b>		
Tetrachloro-m-xylene	84.3	30-150
Decachlorobiphenyl	122	30-150

<b>LABORATORY CONTROL SAMPLE (LCS)</b>	<b>% Recovery</b>	<b>Acceptance Limits</b>
Aroclor 1016	116	40-140
Aroclor 1260	129	40-140
<b>Surrogates:</b>		
Tetrachloro-m-xylene	90.9	30-150
Decachlorobiphenyl	123	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 6010B ANALYSIS**

**Metals by ICP**

**QUALITY CONTROL - SOLID**

**DATE PREPARED: 5/13/03**

QC Sample	Method Blank	Lab Control Sample
Units	mg/kg	% Recovery
Acceptance Limits	Results	80-120 %
Analyte		
Silver (Ag)	<0.500	84.4
Aluminum (Al)	<2.500	95.3
Arsenic (As)	<1.000	90.0
Boron (B)	NA	NA
Barium (Ba)	<0.500	94.1
Beryllium (Be)	<0.500	91.8
Calcium (Ca)	NA	NA
Cadmium (Cd)	<0.500	92.2
Cobalt (Co)	NA	NA
Chromium (Cr)	<0.500	95.4
Copper (Cu)	<1.500	98.8
Iron (Fe)	NA	NA
Magnesium (Mg)	<2.500	98.0
Manganese (Mn)	NA	NA
Molybdenum (Mo)	NA	NA
Nickel (Ni)	<1.000	93.4
Lead (Pb)	<1.000	93.8
Antimony (Sb)	<2.500	82.5
Selenium (Se)	<2.500	86.9
Strontium (Sr)	NA	NA
Titanium (Ti)	NA	NA
Thallium (Tl)	<2.500	87.6
Vanadium (V)	NA	NA
Zinc (Zn)	<1.000	89.6
Zirconium (Zr)	NA	NA

Matrix Spike / Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 7470/7471 ANALYSIS**  
**Mercury by Cold Vapor Atomic Absorption**

**QUALITY CONTROL - SOLID**

**Date Analyzed: 5/19/03**

QC Sample	Method Blank	Lab Control Sample
Units	mg/L	% Recovery
Acceptance Limits	Results	80-120%
<b>Analyte</b>		
Mercury (Hg)	<0.040 (solid)	89.7

Matrix Spike / Duplicate Spike performed as per method  
reported if assigned on Chain of Custody.

W.O. # 0305-00080  
(for lab use only)

[illegible]

CONTAINER TYPE (P-Plastic, G-Glass, V-Vial, O-Other)\*

RELINQUISHED BY: <i>W. J. H. H.</i>	DATE/TIME: <i>APR 16 16 42 PM 1966</i>	RECEIVED BY: <i>W. J. H. H.</i>
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RELINQUISHED BY: \_\_\_\_\_ DATE/TIME \_\_\_\_\_  
RECEIVED BY: \_\_\_\_\_

RELINQUISHED BY: Y. M. Meade DATE/TIME 5/8/03 1625 RECEIVED BY: Waller

Welle  
Auhutten 5/12/03 1230

PROJECT MANAGER: Tim Bridges EXT: 404c.

DATA REPORT ☒ PDF (Adobe) ☐ ASCII ☒ EXCEL Specify State MI

**GZA GEOENVIRONMENTAL, INC.**  
**ENGINEERS AND SCIENTISTS**

106 South Street  
Hopkinton, MA 01748  
(508) 435-9244  
FAX (508) 435-9912

GZA FILE NO. 1600 13190.24 P.O. NO. \_\_\_\_\_

PROJECT Wyman - Gordon West Side

LOCATION North Grafton, Mass.

COLLECTOR(S) TJB, Cmp SHEET 1 OF 2

LAB USE: \_\_\_\_\_  
 TEMP. OF COOLER 6.1 °C  
 TURNAROUND TIME: Standard Rush \_\_\_\_\_ Days, Approved by: \_\_\_\_\_

NOTES: Preservatives, special reporting limits, known contamination, additional testing parameters, etc.:

1. Do not use jars labeled "Hold" on cap
2. For amber jar to be shipped to Triangle Lab, for dioxant Furan analysis,
3. Metals list: arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, thallium, zinc.

⑦  
Two  
3ka  
3/8/03  
me



W.O. # 0305-00080  
(for lab use only)

[illegible]

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:
<i>[Signature]</i>	5/30/12 11:16	Quintan 5/21/03 12
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:

RELINQUISHED BY: \_\_\_\_\_ DATE/TIME: \_\_\_\_\_ RECEIVED BY: \_\_\_\_\_

PROJECT MANAGER: Tim Briggs EXT: None

DATA REPORT ☒ PDF (Adobe) ☐ ASCII ☒ EXCEL Specify State MA

**GZA GEOENVIRONMENTAL, INC.**  
**ENGINEERS AND SCIENTISTS**

106 South Street  
Hopkinton, MA 01748  
(508) 435-9244  
FAX (508) 435-9912



2781053

NOTES: Preservatives, special reporting limits, known contamination, additional testing parameters, etc.:

4. Metals list: Priority Pollutant 13, aluminum, barium, magnesium

5. Hold

LAB USE:  
TURNAROUND TIME: Standard Rush Days, Approved by: TEMP. OF COOLER 6.1 °C

GA FILE NO: 13190.24 P.O. NO. \_\_\_\_\_

PROJECT Wynman - Gordon West Side

LOCATION North Canton, Mass.

COLLECTOR(S) TRB, CMD SHEET 2 OF 2

**GZA GeoEnvironmental, Inc.**  
**106 South Street**  
**Hopkinton, MA 01748**  
**(781) 278-4700**

Laboratory Identification Numbers:  
MA: MA092 NH: 2028 RI: 236  
CT: PH0579 OK: 9928 NC: 615  
NY (NELAC): 11063

**A N A L Y T I C A L   D A T A   R E P O R T**

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608  
(508)755-1700  
T. Briggs

Project No.: 11.0013190.24  
Work Order No.: 0305-00087  
Date Received: 5/13/03  
Date Reported: 5/20/03

**SAMPLE INFORMATION**

Date Sampled	Matrix	Laboratory ID	Sample ID
5/09/2003	Solid	0305-00087 001	SED-7C
5/09/2003	Solid	0305-00087 002	SED-8C
5/09/2003	Solid	0305-00087 003	SED-9C
5/09/2003	Solid	0305-00087 004	SED-29C
5/09/2003	Solid	0305-00087 005	SED-30C
5/09/2003	Solid	0305-00087 006	SED-31C
5/09/2003	Solid	0305-00087 007	SED-32C
5/09/2003	Solid	0305-00087 008	SED-33C
5/09/2003	Solid	0305-00087 009	WG-SS1
5/09/2003	Solid	0305-00087 010	G-SS6
5/09/2003	Solid	0305-00087 011	G-SS7
5/09/2003	Solid	0305-00087 012	G-SS8



GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

T. Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 5/13/03  
Date Reported: 5/20/03  
Work Order No.: 0305-00087

---

### PROJECT NARRATIVE:

#### 1. Sample Receipt

The samples were received on 05/13/03 via   x   GZA courier,   EC,   FEDEX, or   hand delivered. The temperature of the   temperature blank,   X  cooler air was 5.2 degrees C. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference.

The Chain of Custody has been modified to reflect new Project Numbers.

#### 2. EPA Method 8260

Attach QC 8260 05/13/03 - Solid

#### 3. EPA Method 8082 - PCB's

\* The samples indicate the presence of more than one Aroclor product. The PCB concentrations are estimates as some PCB congeners are contained in more than one Aroclor mixture.

Attach QC 8082 05/15/03 - Solid

#### 4. MADEP EPH

Attach QC EPH 05/15/03 - Solid

#### 5. EPA Method 6010 - Metals

Attach QC 6010 05/14/03 - Solid

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

T. Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 5/13/03  
Date Reported: 5/20/03  
Work Order No.: 0305-00087

---

### ANALYTICAL REPORT CERTIFICATION:

---

Were all QA/QC procedures required for the specified analytical method(s) included in this report followed?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

---

Were all QA/QC performance standards for specified analytical methods(s) included in this report met (including those not required to be reported)?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

---

Were all contaminants identified and quantified by the laboratory in the course of this analysis of field samples by comparison to a calibration standard, even if not a requested analyte, reported by the laboratory to the person that requested the analysis?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

---

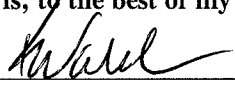
Were all samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation?

Yes [ ☒ ] No [ ☐ ]  
(if "No" must address in narrative.  
Attach additional information if required.)

---

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: \_\_\_\_\_



Date: \_\_\_\_\_



Printed Name: Kathryn Walsh

Position: Laboratory Supervisor

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

T. Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 5/13/03  
Date Reported: 5/20/03  
Work Order No.: 0305-00087

---

### LABORATORY STATEMENTS:

#### Abbreviations:

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

#### Method Key:

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.  
Method 6010: The current version of the method is 6010B.

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per method and are reported at the end of the analytical report if assigned on the Chain of Custody.

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 11.0013190.24

Work Order No.: 0305-00087

Sample ID: SED-29C

Sample Date: 5/09/2003

Sample No.: 004

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		39.1	%	CTG	5/15/03
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/16/03
Aroclor 1262	EPA 8082	< 1800	ug/kg	RJD	5/16/03
Aroclor 1260	EPA 8082	1900*	ug/kg	RJD	5/16/03
Aroclor 1254	EPA 8082	2800*	ug/kg	RJD	5/16/03
Aroclor 1248	EPA 8082	< 1800	ug/kg	RJD	5/16/03
Aroclor 1242/1016	EPA 8082	< 1800	ug/kg	RJD	5/16/03
Aroclor 1232	EPA 8082	< 1800	ug/kg	RJD	5/16/03
Aroclor 1221	EPA 8082	< 1800	ug/kg	RJD	5/16/03
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	109	% R	RJD	5/16/03
***Decachlorobiphenyl	EPA 8082	132	% R	RJD	5/16/03
Extraction		72	DF	RJD	5/15/03
METALS					
Arsenic	EPA 6010	16.4	mg/Kg	AJY	5/15/03
Beryllium	EPA 6010	<0.556	mg/Kg	AJY	5/15/03
Cadmium	EPA 6010	1.58	mg/Kg	AJY	5/15/03
Chromium	EPA 6010	45.2	mg/Kg	AJY	5/15/03
Copper	EPA 6010	114	mg/Kg	AJY	5/15/03
Lead	EPA 6010	78.4	mg/Kg	AJY	5/15/03
Nickel	EPA 6010	40.6	mg/Kg	AJY	5/15/03
Selenium	EPA 6010	3.85	mg/Kg	AJY	5/15/03
Thallium	EPA 6010	<2.78	mg/Kg	AJY	5/15/03
Zinc	EPA 6010	376	mg/Kg	AJY	5/15/03
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	5/17/03
Unadjusted C11-C22 Aromatic Fraction	MADEP	16	mg/kg	OMS	5/17/03
C9-C18 Aliphatic Fraction	MADEP	<2.0	mg/kg	OMS	5/17/03
C19-C36 Aliphatic Fraction	MADEP	23	mg/kg	OMS	5/17/03
C11-C22 Aromatics (excludes target PAHs)	MADEP	16	mg/kg	OMS	5/17/03
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116%R	MADEP	63.0	%R	OMS	5/17/03
***p-Terphenyl (aromatic): 40-135%R	MADEP	61.6	%R	OMS	5/17/03
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	<0.30	mg/kg	OMS	5/17/03
2-Methylnaphthalene (Diesel PAH)	MADEP	<0.30	mg/kg	OMS	5/17/03
Acenaphthylene (Diesel PAH)	MADEP	<0.30	mg/kg	OMS	5/17/03
Acenaphthene (Diesel PAH)	MADEP	<0.30	mg/kg	OMS	5/17/03
Fluorene	MADEP	<0.30	mg/kg	OMS	5/17/03
Phenanthrene (Diesel PAH)	MADEP	<0.30	mg/kg	OMS	5/17/03

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0305-00087

Sample ID: SED-30C  
 Sample Date: 5/09/2003

Sample No.: 005

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		61.3	%	CTG	5/15/03
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/16/03
Aroclor 1262	EPA 8082	< 250	ug/kg	RJD	5/16/03
Aroclor 1260	EPA 8082	310	ug/kg	RJD	5/16/03
Aroclor 1254	EPA 8082	< 250	ug/kg	RJD	5/16/03
Aroclor 1248	EPA 8082	< 250	ug/kg	RJD	5/16/03
Aroclor 1242/1016	EPA 8082	< 250	ug/kg	RJD	5/16/03
Aroclor 1232	EPA 8082	< 250	ug/kg	RJD	5/16/03
Aroclor 1221	EPA 8082	< 250	ug/kg	RJD	5/16/03
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	92.4	% R	RJD	5/16/03
***Decachlorobiphenyl	EPA 8082	88.0	% R	RJD	5/16/03
Extraction		10	DF	RJD	5/15/03
METALS					
Arsenic	EPA 6010	4.11	mg/Kg	AJY	5/15/03
Beryllium	EPA 6010	< 0.622	mg/Kg	AJY	5/15/03
Cadmium	EPA 6010	< 0.783	mg/Kg	AJY	5/15/03
Chromium	EPA 6010	13.7	mg/Kg	AJY	5/15/03
Copper	EPA 6010	28.8	mg/Kg	AJY	5/15/03
Lead	EPA 6010	24.2	mg/Kg	AJY	5/15/03
Nickel	EPA 6010	11.2	mg/Kg	AJY	5/15/03
Selenium	EPA 6010	< 3.11	mg/Kg	AJY	5/15/03
Thallium	EPA 6010	< 3.11	mg/Kg	AJY	5/15/03
Zinc	EPA 6010	82.5	mg/Kg	AJY	5/15/03
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	5/17/03
Unadjusted C11-C22 Aromatic Fraction	MADEP	8.9	mg/kg	OMS	5/17/03
C9-C18 Aliphatic Fraction	MADEP	< 2.0	mg/kg	OMS	5/17/03
C19-C36 Aliphatic Fraction	MADEP	6.3	mg/kg	OMS	5/17/03
C11-C22 Aromatics (excludes target PAHs)	MADEP	8.9	mg/kg	OMS	5/17/03
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116%R	MADEP	80.6	%R	OMS	5/17/03
***p-Terphenyl (aromatic): 40-135%R	MADEP	83.8	%R	OMS	5/17/03
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	5/17/03
2-Methylnaphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	5/17/03
Acenaphthylene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	5/17/03
Acenaphthene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	5/17/03
Fluorene	MADEP	< 0.30	mg/kg	OMS	5/17/03
Phenanthrene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	5/17/03

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0305-00087

Sample ID: SED-31C  
 Sample Date: 5/09/2003

Sample No.: 006

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		25.0	%	CTG	5/15/03
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/16/03
Aroclor 1262	EPA 8082	< 700	ug/kg	RJD	5/16/03
Aroclor 1260	EPA 8082	740*	ug/kg	RJD	5/16/03
Aroclor 1254	EPA 8082	1100*	ug/kg	RJD	5/16/03
Aroclor 1248	EPA 8082	< 700	ug/kg	RJD	5/16/03
Aroclor 1242/1016	EPA 8082	< 700	ug/kg	RJD	5/16/03
Aroclor 1232	EPA 8082	< 700	ug/kg	RJD	5/16/03
Aroclor 1221	EPA 8082	< 700	ug/kg	RJD	5/16/03
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	68.4	% R	RJD	5/16/03
***Decachlorobiphenyl	EPA 8082	78.8	% R	RJD	5/16/03
Extraction		28	DF	RJD	5/15/03
METALS					
Arsenic	EPA 6010	20.8	mg/Kg	AJY	5/15/03
Beryllium	EPA 6010	< 1.49	mg/Kg	AJY	5/15/03
Cadmium	EPA 6010	< 2.11	mg/Kg	AJY	5/15/03
Chromium	EPA 6010	288	mg/Kg	AJY	5/15/03
Copper	EPA 6010	861	mg/Kg	AJY	5/15/03
Lead	EPA 6010	222	mg/Kg	AJY	5/15/03
Nickel	EPA 6010	208	mg/Kg	AJY	5/15/03
Selenium	EPA 6010	< 7.47	mg/Kg	AJY	5/15/03
Thallium	EPA 6010	< 7.47	mg/Kg	AJY	5/15/03
Zinc	EPA 6010	1700	mg/Kg	AJY	5/15/03
EXTRACTABLE PETROLEUM HYDROCARBONS (and PAHs)				OMS	5/17/03
Unadjusted C11-C22 Aromatic Fraction	MADEP	88	mg/kg	OMS	5/17/03
C9-C18 Aliphatic Fraction	MADEP	9.9	mg/kg	OMS	5/17/03
C19-C36 Aliphatic Fraction	MADEP	200	mg/kg	OMS	5/17/03
C11-C22 Aromatics (excludes target PAHs)	MADEP	86	mg/kg	OMS	5/17/03
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116%R	MADEP	70.4	%R	OMS	5/17/03
***p-Terphenyl (aromatic): 40-135%R	MADEP	95.1	%R	OMS	5/17/03
TARGETED PAH ANALYTES	MADEP				
Naphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	5/17/03
2-Methylnaphthalene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	5/17/03
Acenaphthylene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	5/17/03
Acenaphthene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	5/17/03
Fluorene	MADEP	< 0.30	mg/kg	OMS	5/17/03
Phenanthrene (Diesel PAH)	MADEP	< 0.30	mg/kg	OMS	5/17/03

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0305-00087

Sample ID: G-SS6  
 Sample Date: 5/09/2003

Sample No.: 010

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		80.5	%	CTG	5/15/03
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/16/03
Aroclor 1262	EPA 8082	< 14000	ug/kg	RJD	5/16/03
Aroclor 1260	EPA 8082	14000*	ug/kg	RJD	5/16/03
Aroclor 1254	EPA 8082	29000*	ug/kg	RJD	5/16/03
Aroclor 1248	EPA 8082	< 14000	ug/kg	RJD	5/16/03
Aroclor 1242/1016	EPA 8082	< 14000	ug/kg	RJD	5/16/03
Aroclor 1232	EPA 8082	< 14000	ug/kg	RJD	5/16/03
Aroclor 1221	EPA 8082	< 14000	ug/kg	RJD	5/16/03
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	123	% R	RJD	5/16/03
***Decachlorobiphenyl	EPA 8082	124	% R	RJD	5/16/03
Extraction		560	DF	RJD	5/15/03
METALS					
Arsenic	EPA 6010	20.0	mg/Kg	AJY	5/15/03
Beryllium	EPA 6010	< 0.568	mg/Kg	AJY	5/15/03
Cadmium	EPA 6010	< 0.568	mg/Kg	AJY	5/15/03
Chromium	EPA 6010	40.2	mg/Kg	AJY	5/15/03
Copper	EPA 6010	60.6	mg/Kg	AJY	5/15/03
Lead	EPA 6010	34.5	mg/Kg	AJY	5/15/03
Nickel	EPA 6010	74.3	mg/Kg	AJY	5/15/03
Selenium	EPA 6010	< 3.99	mg/Kg	AJY	5/15/03
Thallium	EPA 6010	< 2.84	mg/Kg	AJY	5/15/03
Zinc	EPA 6010	144	mg/Kg	AJY	5/15/03

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0305-00087

Sample ID: G-SS7  
 Sample Date: 5/09/2003

Sample No.: 011

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		78.6	%	CTG	5/15/03
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/16/03
Aroclor 1262	EPA 8082	< 100	ug/kg	RJD	5/16/03
Aroclor 1260	EPA 8082	140*	ug/kg	RJD	5/16/03
Aroclor 1254	EPA 8082	200*	ug/kg	RJD	5/16/03
Aroclor 1248	EPA 8082	< 100	ug/kg	RJD	5/16/03
Aroclor 1242/1016	EPA 8082	< 100	ug/kg	RJD	5/16/03
Aroclor 1232	EPA 8082	< 100	ug/kg	RJD	5/16/03
Aroclor 1221	EPA 8082	< 100	ug/kg	RJD	5/16/03
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	96.3	% R	RJD	5/16/03
***Decachlorobiphenyl	EPA 8082	120	% R	RJD	5/16/03
Extraction		4.0	DF	RJD	5/15/03
METALS					
Arsenic	EPA 6010	18.0	mg/Kg	AJY	5/15/03
Beryllium	EPA 6010	<0.575	mg/Kg	AJY	5/15/03
Cadmium	EPA 6010	<0.575	mg/Kg	AJY	5/15/03
Chromium	EPA 6010	80.6	mg/Kg	AJY	5/15/03
Copper	EPA 6010	858	mg/Kg	AJY	5/15/03
Lead	EPA 6010	21.2	mg/Kg	AJY	5/15/03
Nickel	EPA 6010	30.5	mg/Kg	AJY	5/15/03
Selenium	EPA 6010	< 3.22	mg/Kg	AJY	5/15/03
Thallium	EPA 6010	< 2.88	mg/Kg	AJY	5/15/03
Zinc	EPA 6010	1020	mg/Kg	AJY	5/15/03



GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0305-00087

Sample ID: G-SS8  
 Sample Date: 5/09/2003

Sample No.: 012

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		81.3	%	CTG	5/15/03
POLYCHLORINATED BIPHENYLS	EPA 8082			RJD	5/16/03
Aroclor 1262	EPA 8082	< 50	ug/kg	RJD	5/16/03
Aroclor 1260	EPA 8082	< 50	ug/kg	RJD	5/16/03
Aroclor 1254	EPA 8082	< 50	ug/kg	RJD	5/16/03
Aroclor 1248	EPA 8082	< 50	ug/kg	RJD	5/16/03
Aroclor 1242/1016	EPA 8082	< 50	ug/kg	RJD	5/16/03
Aroclor 1232	EPA 8082	< 50	ug/kg	RJD	5/16/03
Aroclor 1221	EPA 8082	< 50	ug/kg	RJD	5/16/03
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	95.2	% R	RJD	5/16/03
***Decachlorobiphenyl	EPA 8082	132	% R	RJD	5/16/03
Extraction		2.0	DF	RJD	5/15/03
METALS					
Arsenic	EPA 6010	10.7	mg/Kg	AJY	5/15/03
Beryllium	EPA 6010	< 0.585	mg/Kg	AJY	5/15/03
Cadmium	EPA 6010	< 0.585	mg/Kg	AJY	5/15/03
Chromium	EPA 6010	16.3	mg/Kg	AJY	5/15/03
Copper	EPA 6010	14.0	mg/Kg	AJY	5/15/03
Lead	EPA 6010	5.60	mg/Kg	AJY	5/15/03
Nickel	EPA 6010	12.5	mg/Kg	AJY	5/15/03
Selenium	EPA 6010	< 3.20	mg/Kg	AJY	5/15/03
Thallium	EPA 6010	< 2.93	mg/Kg	AJY	5/15/03
Zinc	EPA 6010	34.1	mg/Kg	AJY	5/15/03

EPA Method 8260 Solid Method Blank (MB) and Laboratory Control Sample (LCS) Data

Method Blank

Date Analyzed:	5/13/2003	
Volatiles Organics	Conc. ug/L	Acceptance Limit
dichlorodifluoromethane	< 250	< 250
chloromethane	< 500	< 500
vinyl chloride	< 250	< 250
bromomethane	< 250	< 250
chloroethane	< 250	< 250
trichlorofluoromethane	< 500	< 500
diethyl ether	< 130	< 130
acetone	< 1300	< 1300
1,1-dichloroethene	< 130	< 130
freon 113	< 250	< 250
carbon disulfide	< 130	< 130
dichloromethane	< 250	< 250
tert-butyl alcohol (TBA)	< 130	< 130
methyl-tert-butyl-ether	< 130	< 130
trans-1,2-dichloroethene	< 1300	< 1300
1,1-dichloroethane	< 130	< 130
di-isopropyl ether (DIPE)	< 130	< 130
ethyl tert-butyl ether (EtBE)	< 130	< 130
2-butanone	< 130	< 130
2,2-dichloropropane	< 250	< 250
cis-1,2-dichloroethene	< 130	< 130
chloroform	< 130	< 130
bromochloromethane	< 130	< 130
tetrahydrofuran	< 130	< 130
1,1,1-trichloroethane	< 130	< 130
1,1-dichloropropene	< 130	< 130
carbon tetrachloride	< 130	< 130
1,2-dichloroethane	< 130	< 130
tert-amyl methyl ether (TAME)	< 130	< 130
trichloroethene	< 250	< 250
1,2-dichloropropane	< 130	< 130
bromodichloromethane	< 130	< 130
1,4 dioxane	< 130	< 130
dibromomethane	< 130	< 130
4-methyl-2-pentanone	< 250	< 250
cis-1,3-dichloropropene	< 130	< 130
toluene	< 130	< 130
trans-1,3-dichloropropene	< 130	< 130
1,1,2-trichloroethane	< 250	< 250
2-hexanone	< 130	< 130
1,3-dichloropropane	< 130	< 130
tetrachloroethene	< 130	< 130
dibromochloromethane	< 130	< 130
1,2-dibromoethane (EDB)	< 130	< 130
chlorobenzene	< 130	< 130
1,1,1,2-tetrachloroethane	< 130	< 130
ethyl benzene	< 250	< 250
1,1,2,2-tetrachloroethane	< 130	< 130
m&p-xylene's	< 130	< 130
o-xylene	< 130	< 130
styrene	< 130	< 130
bromoform	< 130	< 130
isopropylbenzene	< 130	< 130
1,2,3-trichloropropane	< 130	< 130
bromobenzene	< 130	< 130
n-propylbenzene	< 130	< 130
2-chlorotoluene	< 130	< 130
1,3,5-trimethylbenzene	< 130	< 130
4-chlorotoluene	< 130	< 130
tert-butyl-benzene	< 130	< 130
1,2,4-trimethylbenzene	< 130	< 130
sec-butyl-benzene	< 130	< 130
p-isopropyltoluene	< 750	< 750
1,3-dichlorobenzene	< 130	< 130
1,4-dichlorobenzene	< 130	< 130
n-butylbenzene	< 130	< 130
1,2-dichlorobenzene	< 130	< 130
1,2-dibromo-3-chloropropane	< 130	< 130
1,2,4-trichlorobenzene	< 130	< 130
hexachlorobutadiene	< 130	< 130
naphthalene	< 130	< 130
1,2,3-trichlorobenzene	< 130	< 130

Laboratory Control Sample

Date Analyzed:	5/13/2003		
Spike Concentration = 20ug/L	% Recovery	Acceptance Limits	Verdict
dichlorodifluoromethane	94.1	70-130	ok
chloromethane	95.6	70-130	ok
vinyl chloride	91.6	70-130	ok
bromomethane	90.7	70-130	ok
chloroethane	98.1	70-130	ok
trichlorofluoromethane	95.1	70-130	ok
diethyl ether	94.7	70-130	ok
acetone	121	70-130	ok
1,1-dichloroethene	94.0	70-130	ok
freon 113	105	70-130	ok
carbon disulfide	102	70-130	ok
dichloromethane	92.6	70-130	ok
tert-butyl alcohol (TBA)	99.8	70-130	ok
methyl-tert-butyl-ether	89.6	70-130	ok
trans-1,2-dichloroethene	94.3	70-130	ok
1,1-dichloroethane	92.7	70-130	ok
di-isopropyl ether (DIPE)	93.3	70-130	ok
ethyl tert-butyl ether (EtBE)	92.6	70-130	ok
2-butanone	111	70-130	ok
2,2-dichloropropane	104	70-130	ok
cis-1,2-dichloroethene	99.2	70-130	ok
chloroform	93.5	70-130	ok
bromochloromethane	95.8	70-130	ok
tetrahydrofuran	87.2	70-130	ok
1,1,1-trichloroethane	96.5	70-130	ok
1,1-dichloropropene	97.1	70-130	ok
carbon tetrachloride	97.3	70-130	ok
1,2-dichloroethane	91.0	70-130	ok
tert-amyl methyl ether (TAME)	92.2	70-130	ok
trichloroethene	101	70-130	ok
1,2-dichloropropane	96.2	70-130	ok
bromodichloromethane	96.3	70-130	ok
1,4 dioxane	0.00	70-130	out
dibromomethane	100	70-130	ok
4-methyl-2-pentanone	138	70-130	out
cis-1,3-dichloropropene	96.9	70-130	ok
toluene	97.3	70-130	ok
trans-1,3-dichloropropene	95.3	70-130	ok
1,1,2-trichloroethane	98.0	70-130	ok
2-hexanone	125	70-130	ok
1,3-dichloropropane	96.4	70-130	ok
tetrachloroethene	107	70-130	ok
dibromochloromethane	102	70-130	ok
1,2-dibromoethane (EDB)	101	70-130	ok
chlorobenzene	104	70-130	ok
1,1,1,2-tetrachloroethane	102	70-130	ok
ethyl benzene	103	70-130	ok
1,1,2,2-tetrachloroethane	100	70-130	ok
m&p-xylene's	98.9	70-130	ok
o-xylene	95.5	70-130	ok
styrene	99.3	70-130	ok
bromoform	106	70-130	ok
isopropylbenzene	99.5	70-130	ok
1,2,3-trichloropropane	98.1	70-130	ok
bromobenzene	105	70-130	ok
n-propylbenzene	99.2	70-130	ok
2-chlorotoluene	90.8	70-130	ok
1,3,5-trimethylbenzene	98.2	70-130	ok
4-chlorotoluene	97.0	70-130	ok
tert-butyl-benzene	101	70-130	ok
1,2,4-trimethylbenzene	98.1	70-130	ok
sec-butyl-benzene	101	70-130	ok
p-isopropyltoluene	102	70-130	ok
1,3-dichlorobenzene	107	70-130	ok
1,4-dichlorobenzene	106	70-130	ok
n-butylbenzene	98.5	70-130	ok
1,2-dichlorobenzene	103	70-130	ok
1,2-dibromo-3-chloropropane	80.7	70-130	ok
1,2,4-trichlorobenzene	116	70-130	ok
hexachlorobutadiene	131	70-130	out
naphthalene	99.8	70-130	ok
1,2,3-trichlorobenzene	113	70-130	ok

SMF criteria allows 5 compounds to be outside acceptance limits

Surrogates:	Recovery (%)	Acceptance Limits	Surrogates:	Recovery (%)	Acceptance Limits	Verdict
DIBROMOFLUOROMETHANE	100	70-130	DIBROMOFLUOROMETHANE	94.8	70-130	ok
1,2-DICHLOROETHANE-D4	112	70-130	1,2-DICHLOROETHANE-D4	104	70-130	ok
TOLUENE-D8	95.8	70-130	TOLUENE-D8	99.0	70-130	ok
4-BROMOFLUOROBENZENE	110	70-130	4-BROMOFLUOROBENZENE	108	70-130	ok
1,2-DICHLOROETHANE-D4	95.0	70-130	1,2-DICHLOROETHANE-D4	99.8	70-130	ok

**GZA GEOENVIRONMENTAL, INC.**  
**ENVIRONMENTAL CHEMISTRY LABORATORY**  
**106 SOUTH STREET, HOPKINTON, MA 01748**  
**MASSACHUSETTS LABORATORY I.D. NO. MA092**

**EPA METHOD 8082 ANALYSIS**  
**QUALITY CONTROL SOLID**

**DATE EXTRACTED: 05/15/03**

**DATE ANALYZED: 05/15/03**

<b>METHOD BLANK</b>	<b>Concentration</b>	<b>Quantitation Limit</b>
<b>POLYCHLORINATED BIPHENYLS as AROCLORS</b>	<b>ug/kg-PPB</b>	<b>ug/kg-PPB</b>
Aroclor 1262	ND	5.0
Aroclor 1260	ND	5.0
Aroclor 1254	ND	5.0
Aroclor 1248	ND	5.0
Aroclor 1242/1016	ND	5.0
Aroclor 1232	ND	5.0
Aroclor 1221	ND	5.0
<b>Surrogates:</b>		
Tetrachloro-m-xylene	109	30-150
Decachlorobiphenyl	130	30-150

<b>LABORATORY CONTROL SAMPLE (LCS)</b>	<b>% Recovery</b>	<b>Acceptance Limits</b>
Aroclor 1016	136	40-140
Aroclor 1260	139	40-140
<b>Surrogates:</b>		
Tetrachloro-m-xylene	111	30-150
Decachlorobiphenyl	132	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

**MADEP EPH**  
**EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 5/15/2003

Solid

METHOD BLANK	AQUEOUS	SOLID	
	ug/L-PPB	mg/kg - PPM	
UNWEIGHTED CONC.			
C9-C18 Aliphatics	<100	<1.0	
C19-C36 Aliphatics	<100	<1.0	
C10-C22 Aromatics	<100	<2.0	
C10-C22 Aromatics (adjusted)	<100	<1.0	
TARGET COMPOUNDS			
Naphthalene	<5.0	<0.30	
2-Methylnaphthalene	<5.0	<0.30	
Acenaphthylene	<5.0	<0.30	
Acenaphthene	<5.0	<0.30	
Fluorene	<5.0	<0.30	
Phenanthrene	<5.0	<0.30	
Anthracene	<5.0	<0.30	
Fluoranthene	<5.0	<0.30	
Pyrene	<5.0	<0.30	
Benzo(a)anthracene	<5.0	<0.30	
Chrysene	<5.0	<0.30	
Benzo(b)fluoranthene	<5.0	<0.30	
Benzo(k)fluoranthene	<5.0	<0.30	
Benzo(a)pyrene	<5.0	<0.30	
Indeno(1,2,3-c,d)pyrene	<5.0	<0.30	
Dibenzo(a,h)anthracene	<5.0	<0.30	
Benzo(g,h,i)perylene	<5.0	<0.30	
Surrogate:	Recovery (%)	Limits-Aqueous	Limits-Solid
***1-Chlorooctadecane (Aliphatic)	81.1	40-130	40-116
***p-Terphenyl (Aromatic)	79.3	40-123	40-135
LABORATORY CONTROL SAMPLE			
	Recovery (%)	Limits-Aqueous	Limits-Solid
Aliphatics:			
Decane	58.4	40-140	40-140
Tetradecane	79.5	40-140	40-140
Octadecane	79.7	40-140	40-140
Tetracosane	81.8	40-140	40-140
Octacosane	78.8	40-140	40-140
Aromatics:			
2-Methylnaphthalene	69.0	40-140	40-140
Phenanthrene	81.8	40-140	40-140
Fluoranthene	87.8	40-140	40-140
Chrysene	83.2	40-140	40-140
Benzo(a)pyrene	90.3	40-140	40-140
Surrogate:	Recovery (%)	Limits-Aqueous	Limits-Solid
***1-Chlorooctadecane (Aliphatic)	85.0	40-130	40-116
***p-Terphenyl (Aromatic)	86.1	40-123	40-135

GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 6010B ANALYSIS**  
**Metals by ICP**

**QUALITY CONTROL - SOLID**

**DATE PREPARED: 05/14/2003**

QC Sample	Method Blank	Lab Control Sample
Units	mg/kg	% Recovery
Acceptance Limits	Results	80-120 %
<b>Analyte</b>		
Silver (Ag)	<0.500	91.9
Aluminum (Al)	<2.500	96.6
Arsenic (As)	<1.000	95.1
Boron (B)	NA	NA
Barium (Ba)	NA	NA
Beryllium (Be)	<0.500	97.1
Calcium (Ca)	NA	NA
Cadmium (Cd)	<0.500	96.9
Cobalt (Co)	NA	NA
Chromium (Cr)	<0.500	101
Copper (Cu)	<1.500	103
Iron (Fe)	NA	NA
Magnesium (Mg)	NA	NA
Manganese (Mn)	NA	NA
Molybdenum (Mo)	NA	NA
Nickel (Ni)	<1.000	98.6
Lead (Pb)	<1.000	98.5
Antimony (Sb)	<2.500	87.4
Selenium (Se)	<2.500	91.6
Strontium (Sr)	NA	NA
Titanium (Ti)	NA	NA
Thallium (Tl)	<2.500	92.4
Vanadium (V)	NA	NA
Zinc (Zn)	<1.000	98.7
Zirconium (Zr)	NA	NA

Matrix Spike / Duplicate Spike performed as per method and  
reported if assigned on Chain of Custody.

W.O. # 6305-00087  
(for lab use only)

*(for lab use only)*

[illegible]

RELINQUISHED BY: DATE/TIME RECEIVED BY: 24

RECEIVED BY:

RELINQUISHED BY:

RELINQUISHED BY:

RELINQUISHED BY:

RELINQUISHED BY:

RELINQUISHED BY:

RELINQUISHED BY:

~~REPRODUCTION~~ BY:

~~REPRODUCTION~~ BY:

~~REPRODUCTION~~ BY:

~~REPRODUCTION~~ BY:

PROJECT MANAGER: Tim Briggs EXT: 4086

PROJECT MANAGER: Tim Briggs EXT: 4086

DATA REPORT ☒ PDF (Adobe) ☐ ASCII ☒ EXCEL Specify State MI

DATA REPORT ☒ PDF (Adobe) ☐ ASCII ☒ EXCEL Specify State MI

**GZA GEOENVIRONMENTAL, INC.**  
**ENGINEERS AND SCIENTISTS**

106 South Street  
Hopkinton, MA 01748  
(508) 435-9244  
FAX (508) 435-9912

LAB USE: \_\_\_\_\_  
 TURNAROUND TIME: Standard Rush \_\_\_\_\_ Days, Approved by: \_\_\_\_\_  
 TEMP. OF COOLER 5.2 °C

11.00  
GZA FILE NO: 13190.24 P.O. NO. \_\_\_\_\_

PROJECT Wyman-Coridan West Side

LOCATION	
Hark Grafton	MARS

COLLECTOR(S) TJB CMD SHEET 1 OF 1

**GZA GeoEnvironmental, Inc.**  
**106 South Street**  
**Hopkinton, MA 01748**  
**(781) 278-4700**

Laboratory Identification Numbers:  
MA: MA092 NH: 2028 RI: 236  
CT: PH0579 OK: 9928 NC: 615  
NY (NELAC): 11063

**ANALYTICAL DATA REPORT**

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608  
(508)755-1700  
Tim Briggs

Project No.: 11.0013190.24  
Work Order No.: 0406-00075  
Date Received: 6/11/04  
Date Reported: 6/24/04

**SAMPLE INFORMATION**

Date Sampled	Matrix	Laboratory ID	Sample ID
6/08/2004	Solid	0406-00075 001	SED-109C
6/08/2004	Solid	0406-00075 002	SED-110C
6/08/2004	Solid	0406-00075 003	SED-107C
6/08/2004	Solid	0406-00075 004	SED-108C
6/08/2004	Solid	0406-00075 005	GSS-105
6/08/2004	Solid	0406-00075 006	GSS-106
6/08/2004	Solid	0406-00075 007	GSS-107
6/08/2004	Solid	0406-00075 008	GSS-108
6/08/2004	Solid	0406-00075 009	GSS-116
6/08/2004	Solid	0406-00075 010	SED-132C
6/08/2004	Solid	0406-00075 011	SED-133C
6/08/2004	Solid	0406-00075 012	SED-140C

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 6/11/04  
Date Reported: 6/24/04  
Work Order No.: 0406-00075

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### PROJECT NARRATIVE:

#### 1. Sample Receipt

The samples were received on 06/10/04 via x GZA courier,    EC,    FEDEX, or    hand delivered. The temperature of the x temperature blank/   cooler air, was 1.8 degrees C. The samples were received intact for all requested analyses. Analyses for Dioxin were subcontracted to Eno River Labs in Durham, NC.

The samples were appropriately preserved in accordance with the method they reference.

The chain of custody has been modified to reflect the new project numbers.

#### #2. EPA Method 8082 - PCB's

\* The samples indicate the presence of more than one Aroclor product. The PCB concentrations are estimates as some PCB congeners are contained in more than one Aroclor mixture.

\*\* The reporting limits are increased due to the solid content of the samples.

D.O. The Surrogates were diluted out due to the high level of target analytes present in sample.

Attach QC 6/18/04 - Solid

Attach QC 06/18/04 - Solid



GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 6/11/04  
Date Reported: 6/24/04  
Work Order No.: 0406-00075

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Data Authorized By: 

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.  
Method 6010: The current version of the method is 6010B.

### Laboratory Identification Numbers:

MA: MA092      NH: 2028  
CT: PH0579      RI: 236  
NC: 615      NY (NELAC): 11063

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per each method and are reported at the end of the analytical report if assigned on the chain of custody.

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0406-00075

Sample ID: GSS-105  
 Sample Date: 6/08/2004

Sample No.: 005

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	6/23/04
Aroclor 1268	EPA 8082	< 800000	ug/kg	TAJ	6/23/04
Aroclor 1262	EPA 8082	< 800000	ug/kg	TAJ	6/23/04
Aroclor 1260	EPA 8082	< 800000	ug/kg	TAJ	6/23/04
Aroclor 1254	EPA 8082	4000000	ug/kg	TAJ	6/23/04
Aroclor 1248	EPA 8082	< 800000	ug/kg	TAJ	6/23/04
Aroclor 1242/1016	EPA 8082	< 800000	ug/kg	TAJ	6/23/04
Aroclor 1232	EPA 8082	< 800000	ug/kg	TAJ	6/23/04
Aroclor 1221	EPA 8082	< 800000	ug/kg	TAJ	6/23/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	D.O.	* % R	TAJ	6/23/04
***Tetrachloro-m-xylene	EPA 8082	D.O.	* % R	TAJ	6/23/04
***Decachlorobiphenyl	EPA 8082	D.O.	* % R	TAJ	6/23/04
***Decachlorobiphenyl	EPA 8082	D.O.	* % R	TAJ	6/23/04
Extraction		32000	DF	TAJ	6/23/04
PERCENT SOLID		79.8	%	TAJ	6/14/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0406-00075

Sample ID: GSS-106  
 Sample Date: 6/08/2004

Sample No.: 006

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	6/23/04
Aroclor 1268	EPA 8082	< 800	ug/kg	TAJ	6/23/04
Aroclor 1262	EPA 8082	< 800	ug/kg	TAJ	6/23/04
Aroclor 1260	EPA 8082	< 800	ug/kg	TAJ	6/23/04
Aroclor 1254	EPA 8082	2200	ug/kg	TAJ	6/23/04
Aroclor 1248	EPA 8082	< 800	ug/kg	TAJ	6/23/04
Aroclor 1242/1016	EPA 8082	< 800	ug/kg	TAJ	6/23/04
Aroclor 1232	EPA 8082	< 800	ug/kg	TAJ	6/23/04
Aroclor 1221	EPA 8082	< 800	ug/kg	TAJ	6/23/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	81.3	% R	TAJ	6/23/04
***Tetrachloro-m-xylene	EPA 8082	88.3	% R	TAJ	6/23/04
***Decachlorobiphenyl	EPA 8082	125	% R	TAJ	6/23/04
***Decachlorobiphenyl	EPA 8082	105	% R	TAJ	6/23/04
Extraction		32	DF	TAJ	6/22/04
PERCENT SOLID		85.7	%	TAJ	6/14/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0406-00075

Sample ID: GSS-107  
 Sample Date: 6/08/2004

Sample No.: 007

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	6/23/04
Aroclor 1268	EPA 8082	< 100000	ug/kg	TAJ	6/23/04
Aroclor 1262	EPA 8082	< 100000	ug/kg	TAJ	6/23/04
Aroclor 1260	EPA 8082	< 100000	ug/kg	TAJ	6/23/04
Aroclor 1254	EPA 8082	260000	ug/kg	TAJ	6/23/04
Aroclor 1248	EPA 8082	< 100000	ug/kg	TAJ	6/23/04
Aroclor 1242/1016	EPA 8082	< 100000	ug/kg	TAJ	6/23/04
Aroclor 1232	EPA 8082	< 100000	ug/kg	TAJ	6/23/04
Aroclor 1221	EPA 8082	< 100000	ug/kg	TAJ	6/23/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	71.9	% R	TAJ	6/23/04
***Tetrachloro-m-xylene	EPA 8082	69.8	% R	TAJ	6/23/04
***Decachlorobiphenyl	EPA 8082	66.9	% R	TAJ	6/23/04
***Decachlorobiphenyl	EPA 8082	117	% R	TAJ	6/23/04
Extraction		4000	DF	TAJ	6/23/04
PERCENT SOLID		81.0	%	TAJ	6/14/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0406-00075

Sample ID: GSS-108  
 Sample Date: 6/08/2004

Sample No.: 008

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	6/23/04
Aroclor 1268	EPA 8082	< 500000	ug/kg	TAJ	6/23/04
Aroclor 1262	EPA 8082	< 500000	ug/kg	TAJ	6/23/04
Aroclor 1260	EPA 8082	< 500000	ug/kg	TAJ	6/23/04
Aroclor 1254	EPA 8082	2000000	ug/kg	TAJ	6/23/04
Aroclor 1248	EPA 8082	< 500000	ug/kg	TAJ	6/23/04
Aroclor 1242/1016	EPA 8082	< 500000	ug/kg	TAJ	6/23/04
Aroclor 1232	EPA 8082	< 500000	ug/kg	TAJ	6/23/04
Aroclor 1221	EPA 8082	< 500000	ug/kg	TAJ	6/23/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	D.O.	* % R	TAJ	6/23/04
***Tetrachloro-m-xylene	EPA 8082	D.O.	* % R	TAJ	6/23/04
***Decachlorobiphenyl	EPA 8082	D.O.	* % R	TAJ	6/23/04
***Decachlorobiphenyl	EPA 8082	D.O.	* % R	TAJ	6/23/04
Extraction		20000	DF	TAJ	6/23/04
PERCENT SOLID		52.5	%	TAJ	6/14/04

**GZA GEOENVIRONMENTAL, INC.**  
**ENVIRONMENTAL CHEMISTRY LABORATORY**  
**106 SOUTH STREET, HOPKINTON, MA 01748**  
**MASSACHUSETTS LABORATORY I.D. NO. MA092**

**EPA METHOD 8082 ANALYSIS**  
**QUALITY CONTROL SOLID**

**DATE EXTRACTED: 06/18/04**

**DATE ANALYZED: 06/21/04**

<b>METHOD BLANK</b>	<b>Concentration</b>		<b>Quantitation Limit</b>
<b>POLYCHLORINATED BIPHENYLS as AROCLORS</b>	<b>ug/kg-PPB</b>		<b>ug/kg-PPB</b>
Aroclor 1262	ND		5.0
Aroclor 1260	ND		5.0
Aroclor 1254	ND		5.0
Aroclor 1248	ND		5.0
Aroclor 1242/1016	ND		5.0
Aroclor 1232	ND		5.0
Aroclor 1221	ND		5.0
<b>Surrogates:</b>	<b>(A)</b>	<b>(B)</b>	
Tetrachloro-m-xylene	110	107	30-150
Decachlorobiphenyl	133	118	30-150

<b>LABORATORY CONTROL SAMPLE (LCS)</b>	<b>% Recovery</b>		<b>Acceptance Limits</b>
Aroclor 1016	49.1	67.0	40-140
Aroclor 1260	118	112	40-140
<b>Surrogates:</b>			
Tetrachloro-m-xylene	107	84.3	30-150
Decachlorobiphenyl	110	90.2	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

# CHAIN-OF-CUSTODY RECORD

W.O. # 0406-00075  
(for lab use only)

Sample I.D.	Date/Time Sampled (Very Important)	Matrix A=Air S=Soil GW=Ground W. SW=Surface W. WW=Waste W. DW=Drinking W. Other (specify)	ANALYSIS REQUIRED			Total # of Cont.	Note #
			pH	Cond.	GC Screen (VOA)		
SED-109e	6/8/04 15:50	Sediment				1	
SED-110e	15:30					1	
SED-107e	15:10					1	
SED-108e	16:10					1	
GSS-105	11:30	Soil				1	
GSS-106	10:15					1	
GSS-107	10:30					1	
GSS-108	11:15					1	
GSS-116	12:00	Soil				2	
SED-132c	12:20	Sediment				2	
SED-133c	12:45					2	
SED-140e	13:10					2	

PRESERVATIVE (C1 - HCl, M=MeOH, N - HNO3, S - H2SO4, Na - NaOH, O - Other)\*

CONTAINER TYPE (P-Plastic, G-Glass, V-Vial, O-Other)\*

RELINQUISHED BY: Alison K. Williams DATE/TIME: 6/9/04 RECEIVED BY: 6/10/04

RELINQUISHED BY: Alison K. Williams DATE/TIME: 6/10/04 RECEIVED BY: 6/10/04

RELINQUISHED BY: Alison K. Williams DATE/TIME: 6/10/04 RECEIVED BY: 6/10/04

PROJECT MANAGER: Jim Briggs EXT: 0730

DATA REPORT ☒ PDF (Adobe) ☐ ASCII ☒ EXCEL Specify State \_\_\_\_\_

**GZA GEOTECHNICAL, INC.**  
ENGINEERS AND SCIENTISTS  
106 South Street  
Hopkinton, MA 01748  
(508) 435-9244  
FAX (508) 435-9912

NOTES: Preservatives, special reporting limits, known contamination, additional testing parameters, etc.:  
1. Ambers 402 jars to be sent to two river labs (see attached chain of custody) for dioxin/furan analysis. (Glove jars sample container 2082) on hold for possible PCB analysis.

TURNAROUND TIME: Standard Rush \_\_\_\_\_ Days, Approved by: \_\_\_\_\_

LAB USE: \_\_\_\_\_ TEMP. OF COOLER 1.4 °C

PROJECT: Wynman - Gordon West Side

LOCATION: Norfolk Station / Millbury, Massachusetts

COLLECTOR(S): Alison Williams / Jim Briggs SHEET 1 OF 2

**GZA GeoEnvironmental, Inc.**  
**106 South Street**  
**Hopkinton, MA 01748**  
**(781) 278-4700**

Laboratory Identification Numbers:  
MA: MA092 NH: 2028 RI: 236  
CT: PH0579 OK: 9928 NC: 615  
NY (NELAC): 11063

**A N A L Y T I C A L   D A T A   R E P O R T**

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608  
(508)755-1700  
Tim Briggs

Project No.: 11.0013190.24  
Work Order No.: 0410-00130  
Date Received: 10/25/04  
Date Reported: 11/01/04

**SAMPLE INFORMATION**

Date Sampled	Matrix	Laboratory ID	Sample ID
10/21/2004	Solid	0410-00130 001	ST2-SS1
10/21/2004	Solid	0410-00130 002	ST2-SS2
10/21/2004	Solid	0410-00130 003	ST2-SS3
10/21/2004	Solid	0410-00130 004	ST2-SS5
10/21/2004	Solid	0410-00130 005	GSS-201
10/21/2004	Solid	0410-00130 006	GSS-202
10/21/2004	Solid	0410-00130 007	GSS-203
10/21/2004	Solid	0410-00130 008	GSS-204
10/21/2004	Solid	0410-00130 009	GSS-205
10/21/2004	Solid	0410-00130 010	GSS-206
10/21/2004	Solid	0410-00130 011	GSS-207
10/21/2004	Solid	0410-00130 012	GSS-208
10/21/2004	Solid	0410-00130 013	W9-SS5
10/21/2004	Solid	0410-00130 014	W9-SS6
10/21/2004	Solid	0410-00130 015	W9-SS7
10/21/2004	Solid	0410-00130 016	W9-SS8
10/22/2004	Solid	0410-00130 017	SED-207C
10/22/2004	Solid	0410-00130 018	SED-208C
10/22/2004	Solid	0410-00130 019	SED-209C
10/21/2004	Solid	0410-00130 020	GSS-105D
10/21/2004	Solid	0410-00130 021	GSS-107D



GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 10/25/04  
Date Reported: 11/01/04  
Work Order No.: 0410-00130

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### PROJECT NARRATIVE:

#### 1. Sample Receipt

The samples were received on 10/25/04 via   x   GZA courier,    EC,    FEDEX, or    hand delivered.  
The temperature of the   x   temperature blank/    cooler air, was 3.2 degrees C. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference.

#### 2. EPA Method 6010B/7471A - Metals

Attach QC 6010B 10/26/04 - Solid  
Attach QC Mercury 10/26/04 - Solid

#### 3. EPA Method 8082 - PCBs

\* The samples indicate the presence of more than one Aroclor product. The PCB concentrations are estimates as some PCB congeners are contained in more than one Aroclor mixture.

The elevated Decachlorobiphenyl surrogate recoveries are due to the presence of this congener at trace levels in Aroclor 1254.

Attach QC 8082 10/25/04 - Solid  
Attach QC 8082 10/26/04 - Solid

#### 4. MADEP EPH

EPH Fractions only were reported.

Attach QC EPH 10/26/04 - Solid

Were any significant modifications made to the VPH or EPH methods?      ( ) Yes    ( x ) No

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 10/25/04  
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Data Authorized By: 

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.  
Method 6010: The current version of the method is 6010B.

### Laboratory Identification Numbers:

MA: MA092      NH: 2028  
CT: PH0579      RI: 236  
NC: 615      NY (NELAC): 11063

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per each method and are reported at the end of the analytical report if assigned on the chain of custody.

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 10/25/04  
Date Reported: 11/01/04  
Work Order No.: 0410-00130

Sample ID: ST2-SS1  
Sample Date: 10/21/2004

Sample No.: 001

Test Performed	Method	Results	Units	Tech	Analysis Date
<b>POLYCHLORINATED BIPHENYLS</b>					
Aroclor 1268	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1262	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1260	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1254	EPA 8082	8000	ug/kg	TAJ	10/27/04
Aroclor 1248	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1242/1016	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1232	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1221	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	77.7	% R	TAJ	10/27/04
***Tetrachloro-m-xylene	EPA 8082	69.4	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	93.6	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	122	% R	TAJ	10/27/04
Extraction	EPA 3541	10	DF	TAJ	10/25/04
<b>EXTRACTABLE PETROLEUM HYDROCARBONS</b>					
Unadjusted C11-C22 Aromatic Fraction	MADEP	84	mg/kg	RJD	10/28/04
C9-C18 Aliphatic Fraction	MADEP	22	mg/kg	RJD	10/28/04
C19-C36 Aliphatic Fraction	MADEP	110	mg/kg	RJD	10/28/04
C11-C22 Aromatics (excludes target PAHs) (excludes targeted PAH analytes)	MADEP	84	mg/kg	RJD	10/28/04
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116%R	MADEP	91.6	%R	RJD	10/28/04
***p-Terphenyl (aromatic): 40-135%R	MADEP	104	%R	RJD	10/28/04
***2-Bromonaphthalene (aromatic)	MADEP	83.6	%R	RJD	10/28/04
Extraction	EPA 3545	1.0	DF	ARL	10/26/04
<b>PRIORITY POLLUTANT METALS</b>					
Beryllium	EPA 6010B	< 0.618	mg/kg	AJY	10/26/04
Silver	EPA 6010B	< 0.618	mg/kg	AJY	10/26/04
Arsenic	EPA 6010B	17.5	mg/kg	AJY	10/26/04
Cadmium	EPA 6010B	0.804	mg/kg	AJY	10/26/04
Chromium	EPA 6010B	43.0	mg/kg	AJY	10/26/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: ST2-SS2  
 Sample Date: 10/21/2004

Sample No.: 002

Test Performed	Method	Results	Units	Tech	Analysis Date
<b>POLYCHLORINATED BIPHENYLS</b>					
Aroclor 1268	EPA 8082	< 100	ug/kg	TAJ	10/25/04
Aroclor 1262	EPA 8082	< 100	ug/kg	TAJ	10/25/04
Aroclor 1260	EPA 8082	240*	ug/kg	TAJ	10/25/04
Aroclor 1254	EPA 8082	230*	ug/kg	TAJ	10/25/04
Aroclor 1248	EPA 8082	< 100	ug/kg	TAJ	10/25/04
Aroclor 1242/1016	EPA 8082	< 100	ug/kg	TAJ	10/25/04
Aroclor 1232	EPA 8082	< 100	ug/kg	TAJ	10/25/04
Aroclor 1221	EPA 8082	< 100	ug/kg	TAJ	10/25/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	121	% R	TAJ	10/25/04
***Tetrachloro-m-xylene	EPA 8082	126	% R	TAJ	10/25/04
***Decachlorobiphenyl	EPA 8082	110	% R	TAJ	10/25/04
***Decachlorobiphenyl	EPA 8082	94.3	% R	TAJ	10/25/04
Extraction	EPA 3541	1.0	DF	TAJ	10/25/04
<b>PRIORITY POLLUTANT METALS</b>					
Beryllium	EPA 6010B	< 0.629	mg/kg	AJY	10/26/04
Silver	EPA 6010B	< 0.629	mg/kg	AJY	10/26/04
Arsenic	EPA 6010B	15.0	mg/kg	AJY	10/26/04
Cadmium	EPA 6010B	< 0.629	mg/kg	AJY	10/26/04
Chromium	EPA 6010B	27.9	mg/kg	AJY	10/26/04
Copper	EPA 6010B	46.2	mg/kg	AJY	10/27/04
Mercury	EPA 7471A	0.0345	mg/kg	NH	10/26/04
Nickel	EPA 6010B	23.6	mg/kg	AJY	10/26/04
Lead	EPA 6010B	20.0	mg/kg	AJY	10/26/04
Antimony	EPA 6010B	< 3.14	mg/kg	AJY	10/26/04
Selenium	EPA 6010B	< 3.14	mg/kg	AJY	10/26/04
Thallium	EPA 6010B	< 3.14	mg/kg	AJY	10/26/04
Zinc	EPA 6010B	95.5	mg/kg	AJY	10/26/04
Aluminum	EPA 6010B	13300	mg/kg	AJY	10/26/04
Barium	EPA 6010B	39.6	mg/kg	AJY	10/26/04
Magnesium	EPA 6010B	3970	mg/kg	AJY	10/26/04
PERCENT SOLID		79.2	%	TAJ	10/26/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: GSS-201  
Sample Date: 10/21/2004

Sample No.: 005

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	10/27/04
Aroclor 1268	EPA 8082	< 50000	ug/kg	TAJ	10/27/04
Aroclor 1262	EPA 8082	< 50000	ug/kg	TAJ	10/27/04
Aroclor 1260	EPA 8082	< 50000	ug/kg	TAJ	10/27/04
Aroclor 1254	EPA 8082	210000	ug/kg	TAJ	10/27/04
Aroclor 1248	EPA 8082	< 50000	ug/kg	TAJ	10/27/04
Aroclor 1242/1016	EPA 8082	< 50000	ug/kg	TAJ	10/27/04
Aroclor 1232	EPA 8082	< 50000	ug/kg	TAJ	10/27/04
Aroclor 1221	EPA 8082	< 50000	ug/kg	TAJ	10/27/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	70.4	% R	TAJ	10/27/04
***Tetrachloro-m-xylene	EPA 8082	52.2	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	144	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	135	% R	TAJ	10/27/04
Extraction	EPA 3541	100	DF	TAJ	10/25/04
PERCENT SOLID		79.7	%	TAJ	10/26/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: GSS-202  
Sample Date: 10/21/2004

Sample No.: 006

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	10/27/04
Aroclor 1268	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1262	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1260	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1254	EPA 8082	5000	ug/kg	TAJ	10/27/04
Aroclor 1248	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1242/1016	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1232	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1221	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	126	% R	TAJ	10/27/04
***Tetrachloro-m-xylene	EPA 8082	106	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	135	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	134	% R	TAJ	10/27/04
Extraction	EPA 3541	10	DF	TAJ	10/25/04
PERCENT SOLID		81.7	%	TAJ	10/26/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: GSS-203  
 Sample Date: 10/21/2004

Sample No.: 007

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	10/27/04
Aroclor 1268	EPA 8082	< 60000	ug/kg	TAJ	10/27/04
Aroclor 1262	EPA 8082	< 60000	ug/kg	TAJ	10/27/04
Aroclor 1260	EPA 8082	< 60000	ug/kg	TAJ	10/27/04
Aroclor 1254	EPA 8082	140000	ug/kg	TAJ	10/27/04
Aroclor 1248	EPA 8082	< 60000	ug/kg	TAJ	10/27/04
Aroclor 1242/1016	EPA 8082	< 60000	ug/kg	TAJ	10/27/04
Aroclor 1232	EPA 8082	< 60000	ug/kg	TAJ	10/27/04
Aroclor 1221	EPA 8082	< 60000	ug/kg	TAJ	10/27/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	93.3	% R	TAJ	10/27/04
***Tetrachloro-m-xylene	EPA 8082	56.0	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	143	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	118	% R	TAJ	10/27/04
Extraction	EPA 3541	100	DF	TAJ	10/25/04
PERCENT SOLID		78.6	%	TAJ	10/26/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: GSS-204  
Sample Date: 10/21/2004

Sample No.: 008

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	10/26/04
Aroclor 1268	EPA 8082	< 50	ug/kg	TAJ	10/26/04
Aroclor 1262	EPA 8082	< 50	ug/kg	TAJ	10/26/04
Aroclor 1260	EPA 8082	< 50	ug/kg	TAJ	10/26/04
Aroclor 1254	EPA 8082	< 50	ug/kg	TAJ	10/26/04
Aroclor 1248	EPA 8082	< 50	ug/kg	TAJ	10/26/04
Aroclor 1242/1016	EPA 8082	< 50	ug/kg	TAJ	10/26/04
Aroclor 1232	EPA 8082	< 50	ug/kg	TAJ	10/26/04
Aroclor 1221	EPA 8082	< 50	ug/kg	TAJ	10/26/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	121	% R	TAJ	10/26/04
***Tetrachloro-m-xylene	EPA 8082	110	% R	TAJ	10/26/04
***Decachlorobiphenyl	EPA 8082	126	% R	TAJ	10/26/04
***Decachlorobiphenyl	EPA 8082	110	% R	TAJ	10/26/04
Extraction	EPA 3541	1.0	DF	TAJ	10/25/04
PERCENT SOLID		82.5	%	TAJ	10/26/04



GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: GSS-205  
Sample Date: 10/21/2004

Sample No.: 009

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	10/26/04
Aroclor 1268	EPA 8082	< 500	ug/kg	TAJ	10/26/04
Aroclor 1262	EPA 8082	< 500	ug/kg	TAJ	10/26/04
Aroclor 1260	EPA 8082	1400*	ug/kg	TAJ	10/26/04
Aroclor 1254	EPA 8082	2100*	ug/kg	TAJ	10/26/04
Aroclor 1248	EPA 8082	< 500	ug/kg	TAJ	10/26/04
Aroclor 1242/1016	EPA 8082	< 500	ug/kg	TAJ	10/26/04
Aroclor 1232	EPA 8082	< 500	ug/kg	TAJ	10/26/04
Aroclor 1221	EPA 8082	< 500	ug/kg	TAJ	10/26/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	102	% R	TAJ	10/26/04
***Tetrachloro-m-xylene	EPA 8082	112	% R	TAJ	10/26/04
***Decachlorobiphenyl	EPA 8082	85.6	% R	TAJ	10/26/04
***Decachlorobiphenyl	EPA 8082	90.4	% R	TAJ	10/26/04
Extraction	EPA 3541	1.0	DF	TAJ	10/25/04
PERCENT SOLID		57.2	%	TAJ	10/26/04
EXTRACTABLE PETROLEUM HYDROCARBONS				RJD	10/28/04
Unadjusted C11-C22 Aromatic Fraction	MADEP	31	mg/kg	RJD	10/28/04
C9-C18 Aliphatic Fraction	MADEP	< 5.0	mg/kg	RJD	10/28/04
C19-C36 Aliphatic Fraction	MADEP	37	mg/kg	RJD	10/28/04
C11-C22 Aromatics (excludes target PAHs)	MADEP	31	mg/kg	RJD	10/28/04
(excludes targeted PAH analytes)					
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116%R	MADEP	45.4	%R	RJD	10/28/04
***p-Terphenyl (aromatic): 40-135%R	MADEP	53.8	%R	RJD	10/28/04
***2-Bromonaphthalene (aromatic)	MADEP	84.3	%R	RJD	10/28/04
Extraction	EPA 3545	1.0	DF	ARL	10/26/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: GSS-206  
 Sample Date: 10/21/2004

Sample No.: 010

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	10/26/04
Aroclor 1268	EPA 8082	< 250	ug/kg	TAJ	10/26/04
Aroclor 1262	EPA 8082	< 250	ug/kg	TAJ	10/26/04
Aroclor 1260	EPA 8082	310*	ug/kg	TAJ	10/26/04
Aroclor 1254	EPA 8082	430*	ug/kg	TAJ	10/26/04
Aroclor 1248	EPA 8082	< 250	ug/kg	TAJ	10/26/04
Aroclor 1242/1016	EPA 8082	< 250	ug/kg	TAJ	10/26/04
Aroclor 1232	EPA 8082	< 250	ug/kg	TAJ	10/26/04
Aroclor 1221	EPA 8082	< 250	ug/kg	TAJ	10/26/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	111	% R	TAJ	10/26/04
***Tetrachloro-m-xylene	EPA 8082	121	% R	TAJ	10/26/04
***Decachlorobiphenyl	EPA 8082	91.4	% R	TAJ	10/26/04
***Decachlorobiphenyl	EPA 8082	96.6	% R	TAJ	10/26/04
Extraction	EPA 3541	1.0	DF	TAJ	10/25/04
PERCENT SOLID		60.7	%	TAJ	10/26/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: GSS-207  
 Sample Date: 10/21/2004

Sample No.: 011

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	10/27/04
Aroclor 1268	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1262	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1260	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1254	EPA 8082	4400	ug/kg	TAJ	10/27/04
Aroclor 1248	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1242/1016	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1232	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Aroclor 1221	EPA 8082	< 1000	ug/kg	TAJ	10/27/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	84.0	% R	TAJ	10/27/04
***Tetrachloro-m-xylene	EPA 8082	102	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	120	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	113	% R	TAJ	10/27/04
Extraction	EPA 3541	10	DF	TAJ	10/25/04
PERCENT SOLID		79.2	%	TAJ	10/26/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: GSS-208  
Sample Date: 10/21/2004

Sample No.: 012

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	10/27/04
Aroclor 1268	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1262	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1260	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1254	EPA 8082	7400	ug/kg	TAJ	10/27/04
Aroclor 1248	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1242/1016	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1232	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Aroclor 1221	EPA 8082	< 2000	ug/kg	TAJ	10/27/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	98.4	% R	TAJ	10/27/04
***Tetrachloro-m-xylene	EPA 8082	107	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	117	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	120	% R	TAJ	10/27/04
Extraction	EPA 3541	10	DF	TAJ	10/25/04
PERCENT SOLID		78.9	%	TAJ	10/26/04
EXTRACTABLE PETROLEUM HYDROCARBONS				RJD	10/28/04
Unadjusted C11-C22 Aromatic Fraction	MADEP	120	mg/kg	RJD	10/28/04
C9-C18 Aliphatic Fraction	MADEP	6.6	mg/kg	RJD	10/28/04
C19-C36 Aliphatic Fraction	MADEP	130	mg/kg	RJD	10/28/04
C11-C22 Aromatics (excludes target PAHs) (excludes targeted PAH analytes)	MADEP	98	mg/kg	RJD	10/28/04
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116 %R	MADEP	81.1	%R	RJD	10/28/04
***p-Terphenyl (aromatic): 40-135 %R	MADEP	93.6	%R	RJD	10/28/04
***2-Bromonaphthalene (aromatic)	MADEP	90.3	%R	RJD	10/28/04
Extraction	EPA 3545	1.0	DF	ARL	10/26/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: GSS-105D

Sample Date: 10/21/2004

Sample No.: 020

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	10/27/04
Aroclor 1268	EPA 8082	< 30000	ug/kg	TAJ	10/27/04
Aroclor 1262	EPA 8082	< 30000	ug/kg	TAJ	10/27/04
Aroclor 1260	EPA 8082	< 30000	ug/kg	TAJ	10/27/04
Aroclor 1254	EPA 8082	78000	ug/kg	TAJ	10/27/04
Aroclor 1248	EPA 8082	< 30000	ug/kg	TAJ	10/27/04
Aroclor 1242/1016	EPA 8082	< 30000	ug/kg	TAJ	10/27/04
Aroclor 1232	EPA 8082	< 30000	ug/kg	TAJ	10/27/04
Aroclor 1221	EPA 8082	< 30000	ug/kg	TAJ	10/27/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	96.9	% R	TAJ	10/27/04
***Tetrachloro-m-xylene	EPA 8082	94.4	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	120	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	124	% R	TAJ	10/27/04
Extraction	EPA 3541	10	DF	TAJ	10/26/04
PERCENT SOLID		86.3	%	TAJ	10/26/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon

Project No.: 11.0013190.24

Work Order No.: 0410-00130

Sample ID: GSS-107D

Sample No.: 021

Sample Date: 10/21/2004

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	10/27/04
Aroclor 1268	EPA 8082	< 6000	ug/kg	TAJ	10/27/04
Aroclor 1262	EPA 8082	< 6000	ug/kg	TAJ	10/27/04
Aroclor 1260	EPA 8082	< 6000	ug/kg	TAJ	10/27/04
Aroclor 1254	EPA 8082	13000	ug/kg	TAJ	10/27/04
Aroclor 1248	EPA 8082	< 6000	ug/kg	TAJ	10/27/04
Aroclor 1242/1016	EPA 8082	< 6000	ug/kg	TAJ	10/27/04
Aroclor 1232	EPA 8082	< 6000	ug/kg	TAJ	10/27/04
Aroclor 1221	EPA 8082	< 6000	ug/kg	TAJ	10/27/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	89.8	% R	TAJ	10/27/04
***Tetrachloro-m-xylene	EPA 8082	106	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	109	% R	TAJ	10/27/04
***Decachlorobiphenyl	EPA 8082	127	% R	TAJ	10/27/04
Extraction	EPA 3541	10	DF	TAJ	10/26/04
PERCENT SOLID		82.5	%	TAJ	10/26/04

GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 6010B ANALYSIS**  
**Metals by ICP**

**QUALITY CONTROL - SOLID**

**DATE PREPARED: 10/26/2004**

**MATRIX SPIKE SAMPLE: 0410-130-4 (ST2-SS5)**

QC Sample	Method Blank	Lab Control Sample	Matrix Spike	Matrix Spike Duplicate	MS/MSD Difference
Units	mg/kg	% Recovery	% Recovery	% Recovery	RPD
Acceptance Limits	Results	80-120 %	70-130 %	70-130 %	30%
<b>Analyte</b>					
Silver (Ag)	<0.500	88.4	93.7	96.4	2.75
Aluminum (Al)	<2.500	104	315*	-250*	1704
Arsenic (As)	<1.000	90.7	91.3	83.1	9.37
Boron (B)	NA	NA	NA	NA	NA
Barium (Ba)	<0.500	94.6	101	88.6	13.3
Beryllium (Be)	<0.500	92.3	94.7	93.1	1.77
Calcium (Ca)	NA	NA	NA	NA	NA
Cadmium (Cd)	<0.500	91.2	92.5	90.3	2.42
Cobalt (Co)	NA	NA	NA	NA	NA
Chromium (Cr)	<0.500	93.8	92.2	84.9	8.24
Copper (Cu)	<1.500	93.7	95.7	74.1	25.4
Iron (Fe)	NA	NA	NA	NA	NA
Magnesium (Mg)	<2.500	95.4	86.0*	-180*	-567
Manganese (Mn)	NA	NA	NA	NA	NA
Molybdenum (Mo)	NA	NA	NA	NA	NA
Nickel (Ni)	<1.000	90.5	76.8	70.9	8.04
Lead (Pb)	<1.000	91.1	92.0	87.4	5.15
Antimony (Sb)	<2.500	91.4	6.15**	6.23	1.30
Selenium (Se)	<2.500	88.0	90.6	88.9	1.85
Strontium (Sr)	NA	NA	NA	NA	NA
Titanium (Ti)	NA	NA	NA	NA	NA
Thallium (Tl)	<2.500	89.8	89.2	87.7	1.79
Vanadium (V)	NA	NA	NA	NA	NA
Zinc (Zn)	<1.000	90.9	146*	94.0*	43.9

\* Sample concentration > 4 X spike level.

\*\*Post Digestion Spike yielded acceptable results, indicating poor digestion efficiency for this analyte.

RPD = Relative Percent Difference

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**EPA METHOD 7470/7471 ANALYSIS**  
**Mercury by Cold Vapor Atomic Absorption**

**QUALITY CONTROL - SOLID**

**Date Analyzed: 10/26/2004**

QC Sample	Method Blank	Lab Control Sample
Units	mg/L	% Recovery
Acceptance Limits	Results	85-115 %
<b>Analyte</b>		
Mercury (Hg)	<0.040 (solid)	98.0

Matrix Spike / Duplicate Spike performed as per method and reported if assigned on Chain of Custody.



**GZA GEOENVIRONMENTAL, INC.**  
**ENVIRONMENTAL CHEMISTRY LABORATORY**  
**106 SOUTH STREET, HOPKINTON, MA 01748**  
**MASSACHUSETTS LABORATORY I.D. NO. MA092**

**EPA METHOD 8082 ANALYSIS**  
**QUALITY CONTROL SOLID**

**DATE EXTRACTED: 10/25/04**

**DATE ANALYZED: 10/25/04**

<b>METHOD BLANK</b>	<b>Concentration</b>		<b>Quantitation Limit</b>
<b>POLYCHLORINATED BIPHENYLS as AROCLORS</b>	<b>ug/kg-PPB</b>		<b>ug/kg-PPB</b>
Aroclor 1262	ND		5.0
Aroclor 1260	ND		5.0
Aroclor 1254	ND		5.0
Aroclor 1248	ND		5.0
Aroclor 1242/1016	ND		5.0
Aroclor 1232	ND		5.0
Aroclor 1221	ND		5.0
<b>Surrogates:</b>	<b>(A)</b>	<b>(B)</b>	
Tetrachloro-m-xylene	121	124	30-150
Decachlorobiphenyl	130	136	30-150

<b>LABORATORY CONTROL SAMPLE (LCS)</b>	<b>% Recovery</b>		<b>Acceptance Limits</b>
Aroclor 1016	48.6	52.3	40-140
Aroclor 1260	99.9	112	40-140
<b>Surrogates:</b>			
Tetrachloro-m-xylene	124	131	30-150
Decachlorobiphenyl	145	119	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

**GZA GEOENVIRONMENTAL, INC.**  
**ENVIRONMENTAL CHEMISTRY LABORATORY**  
**106 SOUTH STREET, HOPKINTON, MA 01748**  
**MASSACHUSETTS LABORATORY I.D. NO. MA092**

**EPA METHOD 8082 ANALYSIS**  
**QUALITY CONTROL SOLID**

**DATE EXTRACTED: 10/26/04**

**DATE ANALYZED: 10/26/04**

<b>METHOD BLANK</b>	<b>Concentration</b>		<b>Quantitation Limit</b>
<b>POLYCHLORINATED BIPHENYLS as AROCLORS</b>	<b>ug/kg-PPB</b>		<b>ug/kg-PPB</b>
Aroclor 1262	ND		5.0
Aroclor 1260	ND		5.0
Aroclor 1254	ND		5.0
Aroclor 1248	ND		5.0
Aroclor 1242/1016	ND		5.0
Aroclor 1232	ND		5.0
Aroclor 1221	ND		5.0
<b>Surrogates:</b>	<b>(A)</b>	<b>(B)</b>	
Tetrachloro-m-xylene	118	132	30-150
Decachlorobiphenyl	123	138	30-150

<b>LABORATORY CONTROL SAMPLE (LCS)</b>	<b>% Recovery</b>		<b>Acceptance Limits</b>
Aroclor 1016	51.6	81.4	40-140
Aroclor 1260	102	106	40-140
<b>Surrogates:</b>			
Tetrachloro-m-xylene	129	119	30-150
Decachlorobiphenyl	122	112	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748 (781) 278-4708  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH**  
**EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 10/26/04                      Solid

Page 1 of 2

METHOD BLANK	AQUEOUS	SOLID
	ug/L-PPB	mg/kg - PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 Aliphatics	<100	<1.0
C19-C36 Aliphatics	<100	<1.0
C10-C22 Aromatics	<100	<2.0
C10-C22 Aromatics (adjusted)	<100	<1.0
<b>TARGET COMPOUNDS</b>		
Naphthalene	<5.0	<0.30
2-Methylnaphthalene	<5.0	<0.30
Acenaphthylene	<5.0	<0.30
Acenaphthene	<5.0	<0.30
Fluorene	<5.0	<0.30
Phenanthrene	<5.0	<0.30
Anthracene	<5.0	<0.30
Fluoranthene	<5.0	<0.30
Pyrene	<5.0	<0.30
Benzo(a)anthracene	<5.0	<0.30
Chrysene	<5.0	<0.30
Benzo(b)fluoranthene	<5.0	<0.30
Benzo(k)fluoranthene	<5.0	<0.30
Benzo(a)pyrene	<5.0	<0.30
Indeno(1,2,3-c,d)pyrene	<5.0	<0.30
Dibenzo(a,h)anthracene	<5.0	<0.30
Benzo(g,h,i)perylene	<5.0	<0.30
<b>Surrogate:</b>	<b>Recovery (%)</b>	<b>Acceptance Limits</b>
***1-Chlorooctadecane (Aliphatic)	95.7	40-140
***p-Terphenyl (Aromatic)	107	40-140
<b>Fractionation Surrogate:</b>		
***2-Bromonaphthalene	66.2	40-140

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748 (781) 278-4708  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH**  
**EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 10/26/04

Solid

LABORATORY CONTROL SAMPLE DUPLICATE LCS	LCS Recovery (%)	LCS Dup Recovery (%)	Limits
<b>Aliphatics:</b>			
Nonane	37.1	36.7	30-140
Decane	46.3	44.5	40-140
Dodecane	58.6	53.6	40-140
Tetradecane	67.5	61.3	40-140
Hexadecane	88.4	73.9	40-140
Octadecane	92.3	92.1	40-140
Nonadecane	80.0	73.7	40-140
Eicosane	94.9	92.4	40-140
Docosane	89.4	86.9	40-140
Tetracosane	87.9	85.2	40-140
Hexacosane	86.5	83.1	40-140
Octacosane	86.5	82.6	40-140
Triacontane	89.5	86.0	40-140
Hexatriacontane	95.2	91.2	40-140
<b>Aromatics:</b>			
Naphthalene	55.6	54.5	40-140
2-Methylnaphthalene	53.5	49.2	40-140
Acenaphthylene	65.6	74.5	40-140
Acenaphthene	64.4	65.0	40-140
Fluorene	58.7	64.1	40-140
Phenanthrene	63.0	69.0	40-140
Anthracene	68.7	72.2	40-140
Fluoranthene	58.2	60.3	40-140
Pyrene	51.6	49.2	40-140
Benzo(a)anthracene	63.5	71.6	40-140
Chrysene	70.1	80.6	40-140
Benzo(b)fluoranthene	68.7	78.5	40-140
Benzo(k)fluoranthene	69.6	83.1	40-140
Benzo(a)pyrene	67.6	74.7	40-140
Indeno(1,2,3-c,d)pyrene	61.4	79.7	40-140
Dibenzo(a,h)anthracene	81.7	91.8	40-140
Benzo(g,h,i)perylene	70.1	83.7	40-140
<b>Surrogate:</b>			
***1-Chlorooctadecane (Aliphatic)	88.6	81.1	40-130
***p-Terphenyl (Aromatic)	70.2	76.4	40-130
<b>Fractionation Surrogate:</b>			
***2-Bromonaphthalene	82.7	80.1	40-140

W.O. # 0410-00130  
(for lab use only)

## ANALYSIS REQUIRED

COLLECTOR(S) Th, Se, Olu SHEET 1 OF 2

G2AP003

## CHAIN-OF-CUSTODY RECORD

11-10 10-K-07  
ANALYSIS REQUIRED

(for lab use only)

7809163

TURNAROUND TIME: Standard Rush \_\_\_\_\_ Days, Approved by: \_\_\_\_\_  
LAB USE: \_\_\_\_\_ TEMP. OF COOLER 3.2 °C

10/25 11:00 3/40.24  
GFA FILE NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
PROJECT Wilson - birds. West side  
LOCATION 11017m 6m ft  
COLLECTOR(S) T43, JBC, DWW  
SHEET 2 OF 2

10/26/06 11:30 AB

**GZA GeoEnvironmental, Inc.**  
**106 South Street**  
**Hopkinton, MA 01748**  
**(781) 278-4700**

Laboratory Identification Numbers:  
MA: MA092 NH: 2028 RI: 236  
CT: PH0579 OK: 9928 NC: 615  
NY (NELAC): 11063

**A N A L Y T I C A L   D A T A   R E P O R T**

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608  
(508)755-1700  
Tim Briggs

Project No.: 11.0013190.24  
Work Order No.: 0410-00164  
Date Received: 10/29/04  
Date Reported: 11/10/04

SAMPLE INFORMATION

Date Sampled	Matrix	Laboratory ID	Sample ID
10/27/2004	Solid	0410-00164 001	SED-231C
10/27/2004	Solid	0410-00164 005	SED-235C

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 10/29/04  
Date Reported: 11/10/04  
Work Order No.: 0410-00164

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### PROJECT NARRATIVE:

#### 1. Sample Receipt

The samples were received on 10/29/04 via    GZA courier,    EC,    FEDEX, or   x   hand delivered. The temperature of the    temperature blank/   x   cooler air, was 5.8 degrees C. The samples were received intact for all requested analyses. Analyses for Dioxin were subcontracted to Eno River Labs.

The samples were appropriately preserved in accordance with the method they reference.

#### 2. EPA Method 8082 - PCBs

Attach QC 8082 11/01/04 - Solid

#### 3. EPA Method 8260 - VOCs

Attach QC 8260 11/01/04 - Solid

Attach QC 8260 11/02/04 - Solid

#### 4. EPA Method 6010B/7471A - Metals

Attach QC 6010B 11/02/04 - Solid

Attach QC Mercury 11/01/04 - Solid

#### 5. MADEP EPH

\* Per the Project Manager report EPH Fractions only.

Attach QC EPH 11/01/04 - Solid

Were any significant modifications made to the VPH or EPH methods?      ( ) Yes    ( x ) No

#### 6. EPA Method 8270 - SVOCs

Attach QC 8270 11/02/04 - Solid



GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT


GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 10/29/04  
Date Reported: 11/10/04  
Work Order No.: 0410-00164

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Data Authorized By: 

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.  
Method 6010: The current version of the method is 6010B.

### Laboratory Identification Numbers:

MA: MA092      NH: 2028  
CT: PH0579      RI: 236  
NC: 615      NY (NELAC): 11063

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per each method and are reported at the end of the analytical report if assigned on the chain of custody.

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 10/29/04  
Date Reported: 11/10/04  
Work Order No.: 0410-00164

Sample ID: SED-231C  
Sample Date: 10/27/2004

Sample No.: 001

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	11/01/04
Aroclor 1268	EPA 8082	< 500	ug/kg	TAJ	11/01/04
Aroclor 1262	EPA 8082	< 500	ug/kg	TAJ	11/01/04
Aroclor 1260	EPA 8082	< 500	ug/kg	TAJ	11/01/04
Aroclor 1254	EPA 8082	750	ug/kg	TAJ	11/01/04
Aroclor 1248	EPA 8082	< 500	ug/kg	TAJ	11/01/04
Aroclor 1242/1016	EPA 8082	< 500	ug/kg	TAJ	11/01/04
Aroclor 1232	EPA 8082	< 500	ug/kg	TAJ	11/01/04
Aroclor 1221	EPA 8082	< 500	ug/kg	TAJ	11/01/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	120	% R	TAJ	11/01/04
***Tetrachloro-m-xylene	EPA 8082	106	% R	TAJ	11/01/04
***Decachlorobiphenyl	EPA 8082	95.6	% R	TAJ	11/01/04
***Decachlorobiphenyl	EPA 8082	93.4	% R	TAJ	11/01/04
Extraction	EPA 3541	20	DF	TAJ	11/01/04
EXTRACTABLE PETROLEUM HYDROCARBONS				RJD	11/02/04
Unadjusted C11-C22 Aromatic Fraction	MADEP	290	mg/kg	RJD	11/02/04
C9-C18 Aliphatic Fraction	MADEP	15	mg/kg	RJD	11/02/04
C19-C36 Aliphatic Fraction	MADEP	100	mg/kg	RJD	11/02/04
C11-C22 Aromatics (excludes target PAHs) (excludes targeted PAH analytes)	MADEP	280	mg/kg	RJD	11/02/04
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116 %R	MADEP	59.5	%R	RJD	11/02/04
***p-Terphenyl (aromatic): 40-135 %R	MADEP	89.9	%R	RJD	11/02/04
***2-Bromonaphthalene (aromatic)	MADEP	67.8	%R	RJD	11/02/04
Extraction	EPA 3545	1.0	DF	RJD	11/01/04
PRIORITY POLLUTANT METALS				AJY	11/02/04
Beryllium	EPA 6010B	< 1.44	mg/kg	AJY	11/02/04
Silver	EPA 6010B	< 1.44	mg/kg	AJY	11/02/04
Arsenic	EPA 6010B	92.8	mg/kg	AJY	11/02/04
Cadmium	EPA 6010B	< 5.76	mg/kg	AJY	11/03/04
Chromium	EPA 6010B	2080	mg/kg	AJY	11/02/04

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
 QUALITY CONTROL SOLID

DATE EXTRACTED: 11/01/04

DATE ANALYZED: 11/01/04

METHOD BLANK	Concentration		Quantitation Limit
POLYCHLORINATED BIPHENYLS as AROCLORS	ug/kg-PPB		ug/kg-PPB
Aroclor 1262	ND		5.0
Aroclor 1260	ND		5.0
Aroclor 1254	ND		5.0
Aroclor 1248	ND		5.0
Aroclor 1242/1016	ND		5.0
Aroclor 1232	ND		5.0
Aroclor 1221	ND		5.0
<b>Surrogates:</b>	<b>(A)</b>	<b>(B)</b>	
Tetrachloro-m-xylene	125	115	30-150
Decachlorobiphenyl	130	113	30-150

LABORATORY CONTROL SAMPLE (LCS)	% Recovery		Acceptance Limits
Aroclor 1016	49.6	84.6	40-140
Aroclor 1260	95.3	99.3	40-140
<b>Surrogates:</b>			
Tetrachloro-m-xylene	120	97.5	30-150
Decachlorobiphenyl	130	112	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

EPA Method 8260 Solid Method Blank (MB) and Laboratory Control Sample (LCS) Data

Method Blank

Date Analyzed:	11/1/2004	
Volatiles Organics	Conc. ug/L	Acceptance Limit
dichlorodifluoromethane	< 250	< 250
chloromethane	< 250	< 250
vinyl chloride	< 250	< 250
bromomethane	< 250	< 250
chloroethane	< 250	< 250
trichlorofluoromethane	< 250	< 250
diethyl ether	< 500	< 500
acetone	< 1300	< 1300
1,1-dichloroethene	< 130	< 130
FREON-113	< 250	< 250
carbon disulfide	< 250	< 250
dichloromethane	< 250	< 250
tert-butyl alcohol (TBA)	< 1300	< 1300
methyl-tert-butyl-ether	< 250	< 250
trans-1,2-dichloroethene	< 130	< 130
1,1-dichloroethane	< 130	< 130
di-isopropyl ether (DIPE)	< 250	< 250
ethyl tert-butyl ether (ETBE)	< 250	< 250
2-butanone	< 1300	< 1300
2,2-dichloropropane	< 130	< 130
cis-1,2-dichloroethene	< 130	< 130
chloroform	< 130	< 130
bromochloromethane	< 130	< 130
tetrahydrofuran	< 750	< 750
1,1,1-trichloroethane	< 130	< 130
1,1-dichloropropene	< 130	< 130
carbon tetrachloride	< 130	< 130
1,2-dichloroethane	< 130	< 130
benzene	< 130	< 130
tert-amyl methyl ether (TAME)	< 250	< 250
trichloroethene	< 130	< 130
1,2-dichloropropane	< 130	< 130
bromodichloromethane	< 130	< 130
1,4-Dioxane	< 2500	< 2500
dibromomethane	< 130	< 130
4-methyl-2-pentanone	< 250	< 250
cis-1,3-dichloropropene	< 130	< 130
toluene	< 130	< 130
trans-1,3-dichloropropene	< 130	< 130
1,1,2-trichloroethane	< 250	< 250
2-hexanone	< 250	< 250
1,3-dichloropropane	< 130	< 130
tetrachloroethene	< 130	< 130
dibromochloromethane	< 130	< 130
1,2-dibromoethane (EDB)	< 130	< 130
chlorobenzene	< 130	< 130
1,1,1,2-tetrachloroethane	< 130	< 130
ethylbenzene	< 130	< 130
1,1,2,2-tetrachloroethane	< 130	< 130
m&p-xylene	< 130	< 130
o-xylene	< 130	< 130
styrene	< 130	< 130
bromoform	< 130	< 130
isopropylbenzene	< 130	< 130
1,2,3-trichloropropane	< 130	< 130
bromobenzene	< 130	< 130
n-propylbenzene	< 130	< 130
2-chlorotoluene	< 130	< 130
1,3,5-trimethylbenzene	< 130	< 130
4-chlorotoluene	< 130	< 130
tert-butyl-benzene	< 130	< 130
1,2,4-trimethylbenzene	< 130	< 130
sec-butyl-benzene	< 130	< 130
p-isopropyltoluene	< 750	< 750
1,3-dichlorobenzene	< 130	< 130
1,4-dichlorobenzene	< 130	< 130
n-butylbenzene	< 130	< 130
1,2-dichlorobenzene	< 130	< 130
1,2-dibromo-3-chloropropane	< 130	< 130
1,2,4-trichlorobenzene	< 130	< 130
hexachlorobutadiene	< 130	< 130
naphthalene	< 130	< 130
1,2,3-trichlorobenzene	< 130	< 130

Laboratory Control Sample

Date Analyzed:	11/1/2004		
Spike Concentration = 20ug/L	% Recovery	Acceptance Limits	Verdict
dichlorodifluoromethane	136	70-130	out
chloromethane	96.1	70-130	ok
vinyl chloride	106	70-130	ok
bromomethane	86.8	70-130	ok
chloroethane	91.3	70-130	ok
trichlorofluoromethane	101	70-130	ok
diethyl ether	104	70-130	ok
acetone	115	70-130	ok
1,1-dichloroethene	90.8	70-130	ok
FREON-113	86.8	70-130	ok
carbon disulfide	92.1	70-130	ok
dichloromethane	92.8	70-130	ok
tert-butyl alcohol (TBA)	118	70-130	ok
methyl-tert-butyl-ether	109	70-130	ok
trans-1,2-dichloroethene	91.5	70-130	ok
1,1-dichloroethane	102	70-130	ok
di-isopropyl ether (DIPE)	117	70-130	ok
ethyl tert-butyl ether (ETBE)	114	70-130	ok
2-butanone	113	70-130	ok
2,2-dichloropropane	111	70-130	ok
cis-1,2-dichloroethene	98.5	70-130	ok
chloroform	104	70-130	ok
bromochloromethane	94.1	70-130	ok
tetrahydrofuran	105	70-130	ok
1,1,1-trichloroethane	102	70-130	ok
1,1-dichloropropene	103	70-130	ok
carbon tetrachloride	102	70-130	ok
1,2-dichloroethane	118	70-130	ok
benzene	99.3	70-130	ok
tert-amyl methyl ether (TAME)	109	70-130	ok
trichloroethene	93.2	70-130	ok
1,2-dichloropropane	105	70-130	ok
bromodichloromethane	108	70-130	ok
1,4-Dioxane	97.0	70-130	ok
dibromomethane	89.9	70-130	ok
4-methyl-2-pentanone	124	70-130	ok
cis-1,3-dichloropropene	105	70-130	ok
toluene	89.4	70-130	ok
trans-1,3-dichloropropene	104	70-130	ok
1,1,2-trichloroethane	90.2	70-130	ok
2-hexanone	113	70-130	ok
1,3-dichloropropane	92.9	70-130	ok
tetrachloroethene	81.1	70-130	ok
dibromochloromethane	92.3	70-130	ok
1,2-dibromoethane (EDB)	91.0	70-130	ok
chlorobenzene	89.4	70-130	ok
1,1,1,2-tetrachloroethane	90.0	70-130	ok
ethylbenzene	87.7	70-130	ok
1,1,2,2-tetrachloroethane	93.7	70-130	ok
m&p-xylene	86.7	70-130	ok
o-xylene	98.6	70-130	ok
styrene	99.2	70-130	ok
bromoform	94.0	70-130	ok
isopropylbenzene	98.4	70-130	ok
1,2,3-trichloropropane	105	70-130	ok
bromobenzene	93.3	70-130	ok
n-propylbenzene	99.6	70-130	ok
2-chlorotoluene	102	70-130	ok
1,3,5-trimethylbenzene	98.6	70-130	ok
4-chlorotoluene	102	70-130	ok
tert-butyl-benzene	95.8	70-130	ok
1,2,4-trimethylbenzene	99.9	70-130	ok
sec-butyl-benzene	97.4	70-130	ok
p-isopropyltoluene	96.5	70-130	ok
1,3-dichlorobenzene	94.2	70-130	ok
1,4-dichlorobenzene	95.1	70-130	ok
n-butylbenzene	100	70-130	ok
1,2-dichlorobenzene	93.7	70-130	ok
1,2-dibromo-3-chloropropane	111	70-130	ok
1,2,4-trichlorobenzene	91.1	70-130	ok
hexachlorobutadiene	85.9	70-130	ok
naphthalene	85.7	70-130	ok
1,2,3-trichlorobenzene	89.4	70-130	ok

SMF criteria allows 5 compounds to be outside acceptance limits

Surrogates:	Recovery (%)	Acceptance Limits	Surrogates:	Recovery (%)	Acceptance Limits	Verdict
DIBROMOFLUOROMETHANE	101	70-130	DIBROMOFLUOROMETHANE	102	70-130	ok
1,2-DICHLOROETHANE-D4	99.8	70-130	1,2-DICHLOROETHANE-D4	104	70-130	ok
TOLUENE-D8	98.7	70-130	TOLUENE-D8	100	70-130	ok
4-BROMOFLUOROBENZENE	92.0	70-130	4-BROMOFLUOROBENZENE	93.3	70-130	ok
1,2-DICHLOROBENZENE-D4	93.7	70-130	1,2-DICHLOROBENZENE-D4	94.6	70-130	ok

EPA Method 8260 Solid Method Blank (MB) and Laboratory Control Sample (LCS) Data

Method Blank

Date Analyzed:	11/2/2004	
Conc. ug/L	Acceptance Limit	
Volatiles Organics	< 250	< 250
dichlorodifluoromethane	< 250	< 250
chloromethane	< 250	< 250
vinyl chloride	< 250	< 250
bromomethane	< 250	< 250
chloroethane	< 250	< 250
trichlorofluoromethane	< 250	< 250
diethyl ether	< 500	< 500
acetone	< 1300	< 1300
1,1-dichloroethene	< 130	< 130
FREON-113	< 250	< 250
carbon disulfide	< 250	< 250
dichloromethane	< 250	< 250
tert-butyl alcohol (TBA)	< 1300	< 1300
methyl-tert-butyl-ether	< 250	< 250
trans-1,2-dichloroethene	< 130	< 130
1,1-dichloroethane	< 130	< 130
di-isopropyl ether (DIPE)	< 250	< 250
ethyl tert-butyl ether (ETBE)	< 250	< 250
2-butanone	< 1300	< 1300
2,2-dichloropropane	< 130	< 130
cis-1,2-dichloroethene	< 130	< 130
chloroform	< 130	< 130
bromochloromethane	< 130	< 130
tetrahydrofuran	< 750	< 750
1,1,1-trichloroethane	< 130	< 130
1,1-dichloropropene	< 130	< 130
carbon tetrachloride	< 130	< 130
1,2-dichloroethane	< 130	< 130
benzene	< 130	< 130
tert-amyl methyl ether (TAME)	< 250	< 250
trichloroethene	< 130	< 130
1,2-dichloropropane	< 130	< 130
bromodichloromethane	< 130	< 130
1,4-Dioxane	< 2500	< 2500
dibromomethane	< 130	< 130
4-methyl-2-pentanone	< 250	< 250
cis-1,3-dichloropropene	< 130	< 130
toluene	< 130	< 130
trans-1,3-dichloropropene	< 130	< 130
1,1,2-trichloroethane	< 250	< 250
2-hexanone	< 250	< 250
1,3-dichloropropane	< 130	< 130
tetrachloroethene	< 130	< 130
dibromochloromethane	< 130	< 130
1,2-dibromoethane (EDB)	< 130	< 130
chlorobenzene	< 130	< 130
1,1,1,2-tetrachloroethane	< 130	< 130
ethylbenzene	< 130	< 130
1,1,2,2-tetrachloroethane	< 130	< 130
m&p-xylene	< 130	< 130
o-xylene	< 130	< 130
styrene	< 130	< 130
bromoform	< 130	< 130
isopropylbenzene	< 130	< 130
1,2,3-trichloropropane	< 130	< 130
bromobenzene	< 130	< 130
n-propylbenzene	< 130	< 130
2-chlorotoluene	< 130	< 130
1,3,5-trimethylbenzene	< 130	< 130
4-chlorotoluene	< 130	< 130
tert-butyl-benzene	< 130	< 130
1,2,4-trimethylbenzene	< 130	< 130
sec-butyl-benzene	< 130	< 130
p-isopropyltoluene	< 750	< 750
1,3-dichlorobenzene	< 130	< 130
1,4-dichlorobenzene	< 130	< 130
n-butylbenzene	< 130	< 130
1,2-dichlorobenzene	< 130	< 130
1,2-dibromo-3-chloropropane	< 130	< 130
1,2,4-trichlorobenzene	< 130	< 130
hexachlorobutadiene	< 130	< 130
naphthalene	< 130	< 130
1,2,3-trichlorobenzene	< 130	< 130

Laboratory Control Sample

Date Analyzed:	11/2/2004		
Spike Concentration = 20ug/L	% Recovery	Acceptance Limits	Verdict
dichlorodifluoromethane	127	70-130	ok
chloromethane	102	70-130	ok
vinyl chloride	97.1	70-130	ok
bromomethane	83.6	70-130	ok
chloroethane	86.2	70-130	ok
trichlorofluoromethane	95.2	70-130	ok
diethyl ether	108	70-130	ok
acetone	121	70-130	ok
1,1-dichloroethene	87.3	70-130	ok
FREON-113	82.1	70-130	ok
carbon disulfide	86.4	70-130	ok
dichloromethane	92.9	70-130	ok
tert-butyl alcohol (TBA)	123	70-130	ok
methyl-tert-butyl-ether	111	70-130	ok
trans-1,2-dichloroethene	86.6	70-130	ok
1,1-dichloroethane	96.9	70-130	ok
di-isopropyl ether (DIPE)	116	70-130	ok
ethyl tert-butyl ether (ETBE)	117	70-130	ok
2-butanone	109	70-130	ok
2,2-dichloropropane	102	70-130	ok
cis-1,2-dichloroethene	92.6	70-130	ok
chloroform	100	70-130	ok
bromochloromethane	92.1	70-130	ok
tetrahydrofuran	123	70-130	ok
1,1,1-trichloroethane	95.4	70-130	ok
1,1-dichloropropene	96.6	70-130	ok
carbon tetrachloride	95.8	70-130	ok
1,2-dichloroethane	116	70-130	ok
benzene	93.3	70-130	ok
tert-amyl methyl ether (TAME)	109	70-130	ok
trichloroethene	88.3	70-130	ok
1,2-dichloropropane	102	70-130	ok
bromodichloromethane	104	70-130	ok
1,4-Dioxane	95.3	70-130	ok
dibromomethane	88.4	70-130	ok
4-methyl-2-pentanone	127	70-130	ok
cis-1,3-dichloropropene	102	70-130	ok
toluene	84.7	70-130	ok
trans-1,3-dichloropropene	105	70-130	ok
1,1,2-trichloroethane	90.2	70-130	ok
2-hexanone	118	70-130	ok
1,3-dichloropropane	96.0	70-130	ok
tetrachloroethene	76.0	70-130	ok
dibromochloromethane	92.7	70-130	ok
1,2-dibromoethane (EDB)	90.9	70-130	ok
chlorobenzene	87.0	70-130	ok
1,1,1,2-tetrachloroethane	88.6	70-130	ok
ethylbenzene	84.9	70-130	ok
1,1,2,2-tetrachloroethane	96.9	70-130	ok
m&p-xylene	83.6	70-130	ok
o-xylene	95.5	70-130	ok
styrene	97.3	70-130	ok
bromoform	95.1	70-130	ok
isopropylbenzene	94.1	70-130	ok
1,2,3-trichloropropane	107	70-130	ok
bromobenzene	92.9	70-130	ok
n-propylbenzene	97.0	70-130	ok
2-chlorotoluene	98.9	70-130	ok
1,3,5-trimethylbenzene	96.5	70-130	ok
4-chlorotoluene	100	70-130	ok
tert-butyl-benzene	92.9	70-130	ok
1,2,4-trimethylbenzene	98.5	70-130	ok
sec-butyl-benzene	94.4	70-130	ok
p-isopropyltoluene	93.2	70-130	ok
1,3-dichlorobenzene	95.1	70-130	ok
1,4-dichlorobenzene	95.3	70-130	ok
n-butylbenzene	97.6	70-130	ok
1,2-dichlorobenzene	93.8	70-130	ok
1,2-dibromo-3-chloropropane	115	70-130	ok
1,2,4-trichlorobenzene	94.5	70-130	ok
hexachlorobutadiene	82.1	70-130	ok
naphthalene	90.8	70-130	ok
1,2,3-trichlorobenzene	93.0	70-130	ok

SMF criteria allows 5 compounds to be outside acceptance limits

Surrogates:	Recovery (%)	Acceptance Limits	Surrogates:	Recovery (%)	Acceptance Limits	Verdict
DIBROMOFLUOROMETHANE	111	70-130	DIBROMOFLUOROMETHANE	101	70-130	ok
1,2-DICHLOROETHANE-D4	103	70-130	1,2-DICHLOROETHANE-D4	103	70-130	ok
TOLUENE-D8	102	70-130	TOLUENE-D8	96.3	70-130	ok
4-BROMOFLUOROBENZENE	92.8	70-130	4-BROMOFLUOROBENZENE	94.4	70-130	ok
1,2-DICHLOROBENZENE-D4	91.0	70-130	1,2-DICHLOROBENZENE-D4	102	70-130	ok

GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 6010B ANALYSIS**  
**Metals by ICP**

**QUALITY CONTROL - SOLID**

**DATE PREPARED: 11/02/2004**

QC Sample	Method Blank	Lab Control Sample
Units	mg/kg	% Recovery
Acceptance Limits	Results	80-120 %
<b>Analyte</b>		
Silver (Ag)	<0.500	88.4
Aluminum (Al)	<2.500	105
Arsenic (As)	<1.000	89.5
Boron (B)	NA	NA
Barium (Ba)	<0.500	95.6
Beryllium (Be)	<0.500	94.1
Calcium (Ca)	NA	NA
Cadmium (Cd)	<0.500	93.3
Cobalt (Co)	NA	NA
Chromium (Cr)	<0.500	95.5
Copper (Cu)	<1.500	97.8
Iron (Fe)	NA	NA
Magnesium (Mg)	<2.500	96.9
Manganese (Mn)	NA	NA
Molybdenum (Mo)	NA	NA
Nickel (Ni)	<1.000	91.7
Lead (Pb)	<1.000	92.1
Antimony (Sb)	<2.500	92.8
Selenium (Se)	<2.500	87.5
Strontium (Sr)	NA	NA
Titanium (Ti)	NA	NA
Thallium (Tl)	<2.500	89.9
Vanadium (V)	NA	NA
Zinc (Zn)	<1.000	96.0

Matrix Spike / Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

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ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 7470/7471 ANALYSIS**  
**Mercury by Cold Vapor Atomic Absorption**

**QUALITY CONTROL - SOLID**

**Date Analyzed: 11/01/2004**

QC Sample	Method Blank	Lab Control Sample
Units	mg/L	% Recovery
Acceptance Limits	Results	85-115 %
<b>Analyte</b>		
Mercury (Hg)	<0.040 (solid)	99.9

Matrix Spike / Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748 (781) 278-4708  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 11/1/04                      Solid

Page 1 of 2

METHOD BLANK	AQUEOUS ug/L-PPB	SOLID mg/kg - PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 Aliphatics	<100	<1.0
C19-C36 Aliphatics	<100	<1.0
C10-C22 Aromatics	<100	<2.0
C10-C22 Aromatics (adjusted)	<100	<1.0
<b>TARGET COMPOUNDS</b>		
Naphthalene	<5.0	<0.30
2-Methylnaphthalene	<5.0	<0.30
Acenaphthylene	<5.0	<0.30
Acenaphthene	<5.0	<0.30
Fluorene	<5.0	<0.30
Phenanthrene	<5.0	<0.30
Anthracene	<5.0	<0.30
Fluoranthene	<5.0	<0.30
Pyrene	<5.0	<0.30
Benzo(a)anthracene	<5.0	<0.30
Chrysene	<5.0	<0.30
Benzo(b)fluoranthene	<5.0	<0.30
Benzo(k)fluoranthene	<5.0	<0.30
Benzo(a)pyrene	<5.0	<0.30
Indeno(1,2,3-c,d)pyrene	<5.0	<0.30
Dibenzo(a,h)anthracene	<5.0	<0.30
Benzo(g,h,i)perylene	<5.0	<0.30
<b>Surrogate:</b>	<b>Recovery (%)</b>	<b>Acceptance Limits</b>
***1-Chlorooctadecane (Aliphatic)	75.6	40-140
***p-Terphenyl (Aromatic)	80.5	40-140
<b>Fractionation Surrogate:</b>		
***2-Bromonaphthalene	94.9	40-140



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 106 SOUTH STREET, HOPKINTON, MA 01748 (781) 278-4708  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 11/1/04

Solid

LABORATORY CONTROL SAMPLE DUPLICATE LCS	LCS Recovery (%)	LCS Dup Recovery (%)	Limits
<b>Aliphatics:</b>			
Nonane	34.0	36.0	30-140
Decane	42.4	46.0	40-140
Dodecane	48.9	57.7	40-140
Tetradecane	55.2	66.8	40-140
Hexadecane	66.7	79.0	40-140
Octadecane	70.9	78.5	40-140
Nonadecane	72.4	77.6	40-140
Eicosane	77.5	87.2	40-140
Docosane	79.4	84.0	40-140
Tetracosane	78.4	82.1	40-140
Hexacosane	76.3	79.7	40-140
Octacosane	74.9	78.1	40-140
Triacontane	74.2	77.2	40-140
Hexatriacontane	75.3	77.6	40-140
<b>Aromatics:</b>			
Naphthalene	56.6	66.4	40-140
2-Methylnaphthalene	55.2	65.8	40-140
Acenaphthylene	68.2	72.8	40-140
Acenaphthene	63.7	71.5	40-140
Fluorene	65.3	75.6	40-140
Phenanthrene	72.1	80.4	40-140
Anthracene	72.9	80.9	40-140
Fluoranthene	78.8	85.4	40-140
Pyrene	78.1	83.8	40-140
Benzo(a)anthracene	76.2	81.0	40-140
Chrysene	79.0	83.9	40-140
Benzo(b)fluoranthene	69.0	72.8	40-140
Benzo(k)fluoranthene	74.4	78.2	40-140
Benzo(a)pyrene	72.4	76.4	40-140
Indeno(1,2,3-c,d)pyrene	72.1	72.2	40-140
Dibenzo(a,h)anthracene	68.5	76.9	40-140
Benzo(g,h,i)perylene	71.0	74.6	40-140
<b>Surrogate:</b>			
***1-Chlorooctadecane (Aliphatic)	74.4	81.6	40-130
***p-Terphenyl (Aromatic)	83.7	87.9	40-130
<b>Fractionation Surrogate:</b>			
***2-Bromonaphthalene	93.0	101	40-140

EPA Method 8270 Solid Method Blank (MB) and Laboratory Control Sample (LCS) Data

Method Blank

Date Extracted:	11/02/04	
Date Analyzed:	11/03/04	
File Name:	K6827	
Volatile Organics	Result	Reporting Limit
n-nitrosodimethylamine	ND	330
pyridine	ND	3300
phenol	ND	330
bis(2-chloroethyl)ether	ND	330
2-chlorophenol	ND	330
1,3-dichlorobenzene	ND	330
1,4-dichlorobenzene	ND	330
benzyl alcohol	ND	660
1,2-dichlorobenzene	ND	330
2-methylphenol	ND	330
bis(2-chloroisopropyl)ether	ND	330
3&4-methylphenol	ND	330
n-nitrosodi-n-propylamine	ND	330
hexachloroethane	ND	330
nitrobenzene	ND	330
isophrone	ND	330
2-nitrophenol	ND	330
2,4-dimethylphenol	ND	330
benzoic acid	ND	330
bis(2-chloroethoxy)methane	ND	330
2,4-dichlorophenol	ND	330
1,2,4-trichlorobenzene	ND	330
naphthalene	ND	330
4-chloroaniline	ND	660
hexachlorobutadiene	ND	330
4-chloro-3-methylphenol	ND	660
2-methylnaphthalene	ND	330
aniline	ND	330
hexachlorocyclopentadiene	ND	1700
2,4,6-trichlorophenol	ND	330
2,4,5-trichlorophenol	ND	330
2-chloronaphthalene	ND	330
2-nitroaniline	ND	1700
dimethylphthalate	ND	330
acenaphthylene	ND	330
2,6-dinitrotoluene	ND	330
3-nitroaniline	ND	1700
acenaphthene	ND	330
2,4-dinitrophenol	ND	3300
dibenzofuran	ND	330
4-nitrophenol	ND	1700
2,4-dinitrotoluene	ND	330
diethylphthalate	ND	330
fluorene	ND	330
4-chlorophenyl phenyl ether	ND	330
4-nitroaniline	ND	660
4,6-dinitro-2-methylphenol	ND	1700
n-nitrosodiphenylamine	ND	330
4-bromophenyl phenyl ether	ND	330
hexachlorobenzene	ND	330
pentachlorophenol	ND	1700
phenanthrene	ND	330
anthracene	ND	330
carbazole	ND	330
di-n-butylphthalate	ND	500
fluoranthene	ND	330
benzidine	ND	330
pyrene	ND	330
butylbenzylphthalate	ND	330
benz [a] anthracene	ND	330
3,3'-dichlorobenzidine	ND	660
chrysene	ND	330
bis(2-ethylhexyl)phthalate	ND	330
di-n-octylphthalate	ND	330
benzo [b] fluoranthene	ND	330
benzo [k] fluoranthene	ND	330
benzo [a] pyrene	ND	330
indeno [1,2,3-cd] pyrene	ND	330
dibenz [a,h] anthracene	ND	330
benzo [ghi] perylene	ND	330

Surrogates:	Recovery (%)	Acceptance Limits
2-FLUOROPHENOL	59.1	30-130
PHENOL-D6	59.1	30-130
NITROBENZENE-D5	59.6	30-130
2-FLUOROBIPHENYL	74.6	30-130
2,4,6-TRIBROMOPHENOL	86.5	30-130
p-TERPHENYL-D14	83.2	30-130

EPA Method 8270 Solid Method Blank (MB) and Laboratory Control Sample (LCS) Data

Laboratory Control Sample

Date Extracted:	11/02/04		
Date Analyzed:	11/03/04		
File Name:	K6828		
Spike Concentration = 20ug/L	% Recovery	Acceptance Limits	Verdict
n-nitrosodimethylamine	80.6	40-140	ok
pyridine	49.4	40-140	ok
phenol	75.6	30-130	ok
bis(2-chloroethyl)ether	75.4	40-140	ok
2-chlorophenol	78.9	30-130	ok
1,3-dichlorobenzene	73.3	40-140	ok
1,4-dichlorobenzene	72.2	40-140	ok
benzyl alcohol	45.6	40-140	ok
1,2-dichlorobenzene	81.6	40-140	ok
2-methylphenol	76.2	30-130	ok
bis(2-chloroisopropyl)ether	66.2	40-140	ok
3&4-methylphenol	119	30-130	ok
n-nitrosodi-n-propylamine	68.1	40-140	ok
hexachloroethane	75.5	40-140	ok
nitrobenzene	72.4	40-140	ok
isophrone	73.6	40-140	ok
2-nitrophenol	70.2	30-130	ok
2,4-dimethylphenol	68.7	30-130	ok
benzoic acid	32.6	30-130	ok
bis(2-chloroethoxy)methane	63.2	40-140	ok
2,4-dichlorophenol	77.7	30-130	ok
1,2,4-trichlorobenzene	78.6	40-140	ok
naphthalene	74.1	40-140	ok
4-chloroaniline	24.7	40-140	out
hexachlorobutadiene	97.3	40-140	ok
4-chloro-3-methylphenol	85.0	30-130	ok
2-methylnaphthalene	80.3	40-140	ok
aniline	57.8	40-140	ok
hexachlorocyclopentadiene	51.1	40-140	ok
2,4,6-trichlorophenol	90.8	30-130	ok
2,4,5-trichlorophenol	90.0	30-130	ok
2-chloronaphthalene	84.3	40-140	ok
2-nitroaniline	55.9	40-140	ok
dimethylphthalate	102	40-140	ok
acenaphthylene	86.1	40-140	ok
2,6-dinitrotoluene	101	40-140	ok
3-nitroaniline	56.9	40-140	ok
acenaphthene	74.4	40-140	ok
2,4-dinitrophenol	35.7	30-130	ok
dibenzofuran	83.9	40-140	ok
4-nitrophenol	53.6	30-130	ok
2,4-dinitrotoluene	86.4	40-140	ok
diethylphthalate	97.4	40-140	ok
fluorene	78.8	40-140	ok
4-chlorophenyl phenyl ether	83.3	40-140	ok
4-nitroaniline	52.6	40-140	ok
4,6-dinitro-2-methylphenol	59.2	30-130	ok
n-nitrosodiphenylamine	86.6	40-140	ok
4-bromophenyl phenyl ether	94.7	40-140	ok
hexachlorobenzene	102	40-140	ok
pentachlorophenol	53.4	30-130	ok
phenanthrene	83.0	40-140	ok
anthracene	77.1	40-140	ok
carbazole	101	40-140	ok
di-n-butylphthalate	96.6	40-140	ok
fluoranthene	75.1	40-140	ok
benzidine	0.09	40-140	ok
pyrene	75.6	40-140	ok
butylbenzylphthalate	75.1	40-140	ok
benz [a] anthracene	66.9	40-140	ok
3,3'-dichlorobenzidine	58.6	40-140	ok
chrysene	72.8	40-140	ok
bis(2-ethylhexyl)phthalate	77.3	40-140	ok
di-n-octylphthalate	86.7	40-140	ok
benzo [b] fluoranthene	76.4	40-140	ok
benzo [k] fluoranthene	76.4	40-140	ok
benzo [a] pyrene	76.1	40-140	ok
indeno [1,2,3-cd] pyrene	73.7	40-140	ok
dibenz [a,h] anthracene	73.8	40-140	ok
benzo [ghi] perylene	75.2	40-140	ok

CAM criteria allows 15% of analytes to exceed criteria.

Surrogates:	Recovery (%)	Acceptance Limits	Verdict
2-FLUOROPHENOL	70.2	30-130	ok
PHENOL-D6	71.6	30-130	ok
NITROBENZENE-D5	71.5	30-130	ok
2-FLUOROBIPHENYL	94.9	30-130	ok
2,4,6-TRIBROMOPHENOL	112	30-130	ok
p-TERPHENYL-D14	90.0	30-130	ok

Sample I.D.	Date/Time Sampled (Very Important)	Matrix A=Air S=Soil SW=Surface W. WW=Waste W. DW=Drinking W. Other (specify)	ANALYSIS REQUIRED				Total # of Cont.	Note #	
			□ pH □ Cond.	HNU	GC Screen (VOA)	□ 524.2 □ 502.1			
SED-231C	10-17-04	SED							
SED-232C	10-17-04								
SED-233C	10-29-04								
SED-234C	10-29-04								
SED-235C	10-29-04								

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME
RELINQUISHED BY: <i>John M. Smith</i>	DATE/TIME: <i>10/21/04 15:30</i>	RECEIVED BY: <i>John M. Smith</i>	DATE/TIME: <i>10/21/04 15:30</i>
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:
RELINQUISHED BY: <i>Tim Briggs</i>	DATE/TIME: <i>10/21/04</i>	RECEIVED BY: <i>Mark</i>

PROJECT MANAGER: *Tim Briggs* EXT. *Mark*

**GZA GEOENVIRONMENTAL, INC.**  
**ENGINEERS AND SCIENTISTS**  
 320 Needham Street  
 NEWTON UPPER FALLS, MA 02464-1594  
 (617) 969-0050  
 FAX (617) 965-7769

TURNAROUND TIME: Standard Rush Days, Approved by: \_\_\_\_\_ TEMP. OF COOLER *5.3* °C

LAB USE: *HR 040*

PROJECT: *Wyanan - Garden West Side*

LOCATION: *North Canton*

COLLECTOR(S): *TJB*

SHEET *1* OF *1*

NOTES: Preservatives, special reporting limits, known contamination, etc.:  
 ① *PHB Plus At Ba Magnesium*  
 ② *Dioxin analysis sub to END, Rice*  
 ③ *EPH only*  
 ④ *Rush / sed 235C ONLY*  
*carried sample 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 57*

**GZA GeoEnvironmental, Inc.**  
**106 South Street**  
**Hopkinton, MA 01748**  
**(781) 278-4700**

Laboratory Identification Numbers:  
MA: MA092 NH: 2028 RI: 236  
CT: PH0579 OK: 9928 NC: 615  
NY (NELAC): 11063

**A N A L Y T I C A L   D A T A   R E P O R T**

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062  
781-278-3700

Project No.: 01.0013190.24  
Work Order No.: 0411-00030  
Date Received: 11/04/04  
Date Reported: 11/12/04

**SAMPLE INFORMATION**

Date Sampled	Matrix	Laboratory ID	Sample ID
10/29/2004	Solid	0411-00030 001	SED - 228C
10/29/2004	Solid	0411-00030 002	SED - 229C

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Project Name: Wyman-Gordon  
Project No.: 01.0013190.24

Date Received: 11/04/04  
Date Reported: 11/12/04  
Work Order No.: 0411-00030

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### PROJECT NARRATIVE:

#### 1. Sample Receipt

The samples were received on 11/04/04 via ☒ GZA courier, ☐ EC, ☐ FEDEX, or ☐ hand delivered.  
The temperature of the ☐ temperature blank/☒ cooler air, was 5.9 degrees C. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference.

#### 2. EPA Method 6010B/7471A - Metals

Attach QC 6010B 11/05/04 - Solid  
Attach QC Mercury 11/09/04 - Solid

#### 3. MADEP EPH

\* Per the Project Manager report EPH Fractions only.

Attach QC EPH 11/08/04 - Solid

Were any significant modifications made to the VPH or EPH methods? ( ) Yes ( x ) No

#### 4. EPA Method 8082 - PCBs

\* The elevated surrogate recovery (Decachlorobiphenyl) is due to its presence at trace levels in the reported Aroclor mixture.

Attach QC 8082 11/09/04 - Solid

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

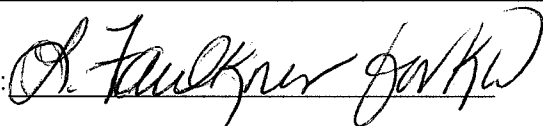
## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Project Name: Wyman-Gordon  
Project No.: 01.0013190.24

Date Received: 11/04/04  
Date Reported: 11/12/04  
Work Order No.: 0411-00030

Data Authorized By:



% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.  
Method 6010: The current version of the method is 6010B.

### Laboratory Identification Numbers:

MA: MA092      NH: 2028  
CT: PH0579      RI: 236  
NC: 615      NY (NELAC): 11063

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per each method and are reported at the end of the analytical report if assigned on the chain of custody.

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Project Name: Wyman-Gordon  
Project No.: 01.0013190.24

Date Received: 11/04/04  
Date Reported: 11/12/04  
Work Order No.: 0411-00030

Sample ID: SED - 228C  
Sample Date: 10/29/2004

Sample No.: 001

Test Performed	Method	Results	Units	Tech	Analysis Date
<b>EXTRACTABLE PETROLEUM HYDROCARBONS</b>					
Unadjusted C11-C22 Aromatic Fraction	MADEP	1100	mg/kg	RJD	11/10/04
C9-C18 Aliphatic Fraction	MADEP	70	mg/kg	RJD	11/09/04
C19-C36 Aliphatic Fraction	MADEP	1400	mg/kg	RJD	11/09/04
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116%R	MADEP	62.2	%R	RJD	11/09/04
***p-Terphenyl (aromatic): 40-135%R	MADEP	103	%R	RJD	11/10/04
***2-Bromonaphthalene (aromatic)	MADEP	99.8	%R	RJD	11/10/04
Extraction	EPA 3545	1.0	DF	ARL	11/08/04
<b>POLYCHLORINATED BIPHENYLS</b>	EPA 8082			RJD	11/10/04
Aroclor 1268	EPA 8082	< 75000	ug/kg	RJD	11/10/04
Aroclor 1262	EPA 8082	< 75000	ug/kg	RJD	11/10/04
Aroclor 1260	EPA 8082	< 75000	ug/kg	RJD	11/10/04
Aroclor 1254	EPA 8082	140000	ug/kg	RJD	11/10/04
Aroclor 1248	EPA 8082	< 75000	ug/kg	RJD	11/10/04
Aroclor 1242/1016	EPA 8082	< 75000	ug/kg	RJD	11/10/04
Aroclor 1232	EPA 8082	< 75000	ug/kg	RJD	11/10/04
Aroclor 1221	EPA 8082	< 75000	ug/kg	RJD	11/10/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	92.3	% R	RJD	11/10/04
***Tetrachloro-m-xylene	EPA 8082	133	% R	RJD	11/10/04
***Decachlorobiphenyl	EPA 8082	128	% R	RJD	11/10/04
***Decachlorobiphenyl	EPA 8082	152	* % R	RJD	11/10/04
Extraction	EPA 3541	4000	DF	TAJ	11/09/04
<b>PRIORITY POLLUTANT METALS</b>				AJY	11/08/04
Beryllium	EPA 6010B	< 0.547	mg/kg	AJY	11/08/04
Silver	EPA 6010B	< 0.547	mg/kg	AJY	11/08/04
Arsenic	EPA 6010B	23.9	mg/kg	AJY	11/08/04
Cadmium	EPA 6010B	1.29	mg/kg	AJY	11/08/04
Chromium	EPA 6010B	90.3	mg/kg	AJY	11/08/04
Copper	EPA 6010B	157	mg/kg	AJY	11/08/04
Mercury	EPA 7471A	0.335	mg/kg	NH	11/09/04



GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 01.0013190.24

Work Order No.: 0411-00030

Sample ID: SED - 229C  
 Sample Date: 10/29/2004

Sample No.: 002

Test Performed	Method	Results	Units	Tech	Analysis Date
EXTRACTABLE PETROLEUM HYDROCARBONS					
Unadjusted C11-C22 Aromatic Fraction	MADEP	100	mg/kg	RJD	11/10/04
C9-C18 Aliphatic Fraction	MADEP	23	mg/kg	RJD	11/10/04
C19-C36 Aliphatic Fraction	MADEP	220	mg/kg	RJD	11/10/04
Surrogates:	MADEP				
***1-Chlorooctadecane (aliphatic): 40-116%R	MADEP	74.1	%R	RJD	11/10/04
***p-Terphenyl (aromatic): 40-135%R	MADEP	68.8	%R	RJD	11/10/04
***2-Bromonaphthalene (aromatic)	MADEP	69.0	%R	RJD	11/10/04
Extraction	EPA 3545	1.0	DF	ARL	11/08/04
POLYCHLORINATED BIPHENYLS					
Aroclor 1268	EPA 8082	< 15000	ug/kg	RJD	11/10/04
Aroclor 1262	EPA 8082	< 15000	ug/kg	RJD	11/10/04
Aroclor 1260	EPA 8082	< 15000	ug/kg	RJD	11/10/04
Aroclor 1254	EPA 8082	40000	ug/kg	RJD	11/10/04
Aroclor 1248	EPA 8082	< 15000	ug/kg	RJD	11/10/04
Aroclor 1242/1016	EPA 8082	< 15000	ug/kg	RJD	11/10/04
Aroclor 1232	EPA 8082	< 15000	ug/kg	RJD	11/10/04
Aroclor 1221	EPA 8082	< 15000	ug/kg	RJD	11/10/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	111	% R	RJD	11/10/04
***Tetrachloro-m-xylene	EPA 8082	121	% R	RJD	11/10/04
***Decachlorobiphenyl	EPA 8082	135	% R	RJD	11/10/04
***Decachlorobiphenyl	EPA 8082	162	* % R	RJD	11/10/04
Extraction	EPA 3541	1000	DF	TAJ	11/09/04
PRIORITY POLLUTANT METALS					
Beryllium	EPA 6010B	< 0.973	mg/kg	AJY	11/08/04
Silver	EPA 6010B	< 0.973	mg/kg	AJY	11/08/04
Arsenic	EPA 6010B	30.5	mg/kg	AJY	11/08/04
Cadmium	EPA 6010B	2.39	mg/kg	AJY	11/08/04
Chromium	EPA 6010B	56.0	mg/kg	AJY	11/08/04
Copper	EPA 6010B	177	mg/kg	AJY	11/08/04
Mercury	EPA 7471A	0.279	mg/kg	NH	11/09/04
Nickel	EPA 6010B	55.3	mg/kg	AJY	11/08/04
Lead	EPA 6010B	234	mg/kg	AJY	11/08/04
Antimony	EPA 6010B	< 4.87	mg/kg	AJY	11/08/04
Selenium	EPA 6010B	4.88	mg/kg	AJY	11/08/04
Thallium	EPA 6010B	< 4.87	mg/kg	AJY	11/08/04
Zinc	EPA 6010B	823	mg/kg	AJY	11/08/04
Aluminum	EPA 6010B	32500	mg/kg	AJY	11/08/04
Barium	EPA 6010B	113	mg/kg	AJY	11/08/04

GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 6010B ANALYSIS**

**Metals by ICP**

**QUALITY CONTROL - SOLID**

**DATE PREPARED: 11/05/2004**

QC Sample	Method Blank	Lab Control Sample
Units	mg/kg	% Recovery
Acceptance Limits	Results	80-120 %
<b>Analyte</b>		
Silver (Ag)	<0.500	85.8
Aluminum (Al)	<2.500	115
Arsenic (As)	<1.000	90.3
Boron (B)	NA	NA
Barium (Ba)	<0.500	90.8
Beryllium (Be)	<0.500	89.3
Calcium (Ca)	NA	NA
Cadmium (Cd)	<0.500	88.8
Cobalt (Co)	NA	NA
Chromium (Cr)	<0.500	92.6
Copper (Cu)	<1.500	95.7
Iron (Fe)	NA	NA
Magnesium (Mg)	<2.500	91.8
Manganese (Mn)	NA	NA
Molybdenum (Mo)	NA	NA
Nickel (Ni)	<1.000	89.3
Lead (Pb)	<1.000	87.5
Antimony (Sb)	<2.500	91.5
Selenium (Se)	<2.500	87.6
Strontium (Sr)	NA	NA
Titanium (Ti)	NA	NA
Thallium (Tl)	<2.500	86.5
Vanadium (V)	NA	NA
Zinc (Zn)	<1.000	90.9

Matrix Spike / Duplicate Spike performed as per method and  
reported if assigned on Chain of Custody.

GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 7470/7471 ANALYSIS**  
**Mercury by Cold Vapor Atomic Absorption**

**QUALITY CONTROL - SOLID**

**Date Analyzed: 11/09/2004**

QC Sample	Method Blank	Lab Control Sample
Units	mg/L	% Recovery
Acceptance Limits	Results	85-115 %
<b>Analyte</b>		
Mercury (Hg)	<0.040 (solid)	104

Matrix Spike / Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748 (781) 278-4708  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH  
 EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 11/8/04

Solid

Page 1 of 2

METHOD BLANK	AQUEOUS ug/L-PPB	SOLID mg/kg - PPM
<b>UNWEIGHTED CONC.</b>		
C9-C18 Aliphatics	<100	<1.0
C19-C36 Aliphatics	<100	<1.0
C10-C22 Aromatics	<100	<2.0
C10-C22 Aromatics (adjusted)	<100	<1.0
<b>TARGET COMPOUNDS</b>		
Naphthalene	<5.0	<0.30
2-Methylnaphthalene	<5.0	<0.30
Acenaphthylene	<5.0	<0.30
Acenaphthene	<5.0	<0.30
Fluorene	<5.0	<0.30
Phenanthrene	<5.0	<0.30
Anthracene	<5.0	<0.30
Fluoranthene	<5.0	<0.30
Pyrene	<5.0	<0.30
Benzo(a)anthracene	<5.0	<0.30
Chrysene	<5.0	<0.30
Benzo(b)fluoranthene	<5.0	<0.30
Benzo(k)fluoranthene	<5.0	<0.30
Benzo(a)pyrene	<5.0	<0.30
Indeno(1,2,3-c,d)pyrene	<5.0	<0.30
Dibenzo(a,h)anthracene	<5.0	<0.30
Benzo(g,h,i)perylene	<5.0	<0.30
<b>Surrogate:</b>	<b>Recovery (%)</b>	<b>Acceptance Limits</b>
***1-Chlorooctadecane (Aliphatic)	70.6	40-140
***p-Terphenyl (Aromatic)	76.6	40-140
<b>Fractionation Surrogate:</b>		
***2-Bromonaphthalene	69.7	40-140

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748 (781) 278-4708  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

**MADEP EPH**  
**EXTRACTABLES IN AQUEOUS AND/OR SOLID MATRIX**

**QUALITY CONTROL**

EXT. DATE: 11/8/04

Solid

LABORATORY CONTROL SAMPLE DUPLICATE LCS	LCS Recovery (%)	LCS Dup Recovery (%)	Limits
<b>Aliphatics:</b>			
Nonane	33.6	37.3	30-140
Decane	42.4	46.7	40-140
Dodecane	52.1	53.9	40-140
Tetradecane	62.0	63.6	40-140
Hexadecane	68.3	73.6	40-140
Octadecane	75.1	71.7	40-140
Nonadecane	65.7	67.3	40-140
Eicosane	75.9	73.3	40-140
Docosane	69.1	68.9	40-140
Tetracosane	68.1	68.1	40-140
Hexacosane	68.2	68.2	40-140
Octacosane	66.9	67.4	40-140
Triacontane	70.6	71.7	40-140
Hexatriacontane	73.6	74.4	40-140
<b>Aromatics:</b>			
Naphthalene	58.6	61.4	40-140
2-Methylnaphthalene	57.7	63.2	40-140
Acenaphthylene	68.2	70.1	40-140
Acenaphthene	70.2	90.2	40-140
Fluorene	66.8	69.3	40-140
Phenanthrene	62.5	64.9	40-140
Anthracene	74.4	76.9	40-140
Fluoranthene	68.3	71.9	40-140
Pyrene	76.3	75.7	40-140
Benzo(a)anthracene	59.0	62.9	40-140
Chrysene	76.6	80.9	40-140
Benzo(b)fluoranthene	59.4	64.5	40-140
Benzo(k)fluoranthene	81.1	87.9	40-140
Benzo(a)pyrene	72.5	78.9	40-140
Indeno(1,2,3-c,d)pyrene	47.5	48.5	40-140
Dibenzo(a,h)anthracene	102	90.2	40-140
Benzo(g,h,i)perylene	71.9	68.5	40-140
<b>Surrogate:</b>			
***1-Chlorooctadecane (Aliphatic)	65.0	65.7	40-130
***p-Terphenyl (Aromatic)	55.5	57.8	40-130
<b>Fractionation Surrogate:</b>			
***2-Bromonaphthalene	70.6	68.5	40-140

**GZA GEOENVIRONMENTAL, INC.**  
**ENVIRONMENTAL CHEMISTRY LABORATORY**  
**106 SOUTH STREET, HOPKINTON, MA 01748**  
**MASSACHUSETTS LABORATORY I.D. NO. MA092**

**EPA METHOD 8082 ANALYSIS**  
**QUALITY CONTROL SOLID**

**DATE EXTRACTED: 11/9/04**

**DATE ANALYZED: 11/9/04**

<b>METHOD BLANK</b>	<b>Concentration</b>	<b>Quantitation Limit</b>
<b>POLYCHLORINATED BIPHENYLS as AROCLORS</b>	<b>ug/kg-PPB</b>	<b>ug/kg-PPB</b>
Aroclor 1262	ND	5.0
Aroclor 1260	ND	5.0
Aroclor 1254	ND	5.0
Aroclor 1248	ND	5.0
Aroclor 1242/1016	ND	5.0
Aroclor 1232	ND	5.0
Aroclor 1221	ND	5.0
<b>Surrogates:</b>		
Tetrachloro-m-xylene	123	30-150
Decachlorobiphenyl	148	30-150

<b>LABORATORY CONTROL SAMPLE (LCS)</b>	<b>% Recovery</b>	<b>Acceptance Limits</b>
Aroclor 1016	101	40-140
Aroclor 1260	131	40-140
<b>Surrogates:</b>		
Tetrachloro-m-xylene	117	30-150
Decachlorobiphenyl	137	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

Cell 1

CHAIN-OF-CUSTODY RECORD

Sample I.D.	Date/Time Sampled <small>(Very Important)</small>	Matrix A=Air S=Soil G=W-Ground W. SW-Minors W. DW-Dinking W. Other (specify) _____	ANALYSIS REQUIRED																Total # of Cont.	Note #								
			WW ONLY																									
SFD - 228C	10-24-04 17:00	Sed	<input type="checkbox"/> pH <input type="checkbox"/> Cond.	HNU	GC Screen (VOA)	<input type="checkbox"/> 524.2 <input type="checkbox"/> 502.1	624	<input type="checkbox"/> 601 <input type="checkbox"/> 602	625	8260	8260-"8240" List	8021	8021-"8010" List	8021-"8020" List	8270 <input type="checkbox"/> PAH <input type="checkbox"/> A <input type="checkbox"/> BN	8082-PCBs Only	8081-Pest Only	TPH-GC (Mod. 8100)	TPH-GC w/FING	EPH (MA DEP) ①	VPH (MA DEP)	TCLP (Spec. Below)	Filtering ( <input checked="" type="checkbox"/> if requested)	Metals PPM-13 <input type="checkbox"/> R-8	Metals (List Below) ②			
SFO - 229C	10-24-04 16:30	Sed								X	X	X	#3 X	X	X	X	X	X	X	X	X	X	X	X	X	X	2	2
PRESERVATIVE (CI-HCl, MeOH, N-HNO <sub>3</sub> , S-H <sub>2</sub> SO <sub>4</sub> , Na-NaOH, O-Other)* "																												
CONTAINER TYPE (P-Plastic, G-Glass, V-Vial, T-Teflon, O-Other)*																												
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:																										
Jm Myron	11-2-04 12:30	Cathy Seal																										
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:																										
CS																												
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:																										
Marye	11-4-04 9:30am	Maria																										
PROJECT MANAGER:	EXT:																											
Tim Biaggis		LORC																										

GZA GEOENVIRONMENTAL, INC.  
ENGINEERS AND SCIENTISTS  
320 Needham Street  
NEWTON UPPER FALLS, MA 02464-1594  
(617) 969-0050  
FAX (617) 965-7769

NOTES:  
Preservatives, special reporting limits, known contamination, etc.:  
① EPH only - NO PAH  
② Metals = Pb, Cu, Al, Ba, Magnesium  
③ Mistake do not filter Kuper TBriags 11/4/04

TURNAROUND TIME: Standard Rush Days, Approved by: LAB USE:  
TEMP. OF COOLER 5.9°C  
GZA FILE NO: PROJECT LOCATION COLLECTOR(S)  
Wymon-Laban West Side  
Nahn CIAFR  
TJ  
PO. NO.  
SHEET 1 OF 1

**GZA GeoEnvironmental, Inc.**  
**106 South Street**  
**Hopkinton, MA 01748**  
**(781) 278-4700**

Laboratory Identification Numbers:  
MA: MA092 NH: 2028 RI: 236  
CT: PH0579 OK: 9928 NC: 615  
NY (NELAC): 11063

**A N A L Y T I C A L   D A T A   R E P O R T**

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608  
(508)755-1700  
Tim Briggs

Project No.: 11.0013190.24  
Work Order No.: 0412-00043  
Date Received: 12/03/04  
Date Reported: 12/13/04

**SAMPLE INFORMATION**

Date Sampled	Matrix	Laboratory ID	Sample ID
12/03/2004	Solid	0412-00043 001	GSS-209
12/03/2004	Solid	0412-00043 002	GSS-210
12/03/2004	Solid	0412-00043 003	GSS-211
12/03/2004	Solid	0412-00043 004	GSS-212



GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 12/03/04  
Date Reported: 12/13/04  
Work Order No.: 0412-00043

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### PROJECT NARRATIVE:

#### 1. Sample Receipt

The samples were received on 12/03/04 via    GZA courier,    EC,    FEDEX, or    x    hand delivered.  
The temperature of the    temperature blank/    x    cooler air, was 8.9 degrees C. The samples were received intact for all requested analyses.

The samples were appropriately preserved in accordance with the method they reference.

#### 2. EPA Method 8082 - PCBs

Attach QC 8082 12/06/04 - Solid  
Attach QC 8082 12/09/04 - Solid

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 12/03/04  
Date Reported: 12/13/04  
Work Order No.: 0412-00043

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Data Authorized By: \_\_\_\_\_



% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.  
Method 6010: The current version of the method is 6010B.

### Laboratory Identification Numbers:

MA: MA092      NH: 2028  
CT: PH0579      RI: 236  
NC: 615      NY (NELAC): 11063

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per each method and are reported at the end of the analytical report if assigned on the chain of custody.

GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
33 Waldo Street  
Worcester, MA 01608

Tim Briggs

Project Name: Wyman-Gordon  
Project No.: 11.0013190.24

Date Received: 12/03/04  
Date Reported: 12/13/04  
Work Order No.: 0412-00043

Sample ID: GSS-209  
Sample Date: 12/03/2004

Sample No.: 001

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	12/08/04
Aroclor 1268	EPA 8082	< 150	ug/kg	TAJ	12/08/04
Aroclor 1262	EPA 8082	< 150	ug/kg	TAJ	12/08/04
Aroclor 1260	EPA 8082	< 150	ug/kg	TAJ	12/08/04
Aroclor 1254	EPA 8082	310	ug/kg	TAJ	12/08/04
Aroclor 1248	EPA 8082	< 150	ug/kg	TAJ	12/08/04
Aroclor 1242/1016	EPA 8082	< 150	ug/kg	TAJ	12/08/04
Aroclor 1232	EPA 8082	< 150	ug/kg	TAJ	12/08/04
Aroclor 1221	EPA 8082	< 150	ug/kg	TAJ	12/08/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	116	% R	TAJ	12/08/04
***Tetrachloro-m-xylene	EPA 8082	133	% R	TAJ	12/08/04
***Decachlorobiphenyl	EPA 8082	111	% R	TAJ	12/08/04
***Decachlorobiphenyl	EPA 8082	128	% R	TAJ	12/08/04
Extraction	EPA 3541	2.0	DF	TAJ	12/06/04
PERCENT SOLID		83.4	%	TAJ	12/07/04

GZA GeoEnvironmental, Inc.

## ANALYTICAL REPORT

Project Name: Wyman-Gordon  
 Project No.: 11.0013190.24

Work Order No.: 0412-00043

Sample ID: GSS-210  
 Sample Date: 12/03/2004

Sample No.: 002

Test Performed	Method	Results	Units	Tech	Analysis Date
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	12/08/04
Aroclor 1268	EPA 8082	< 25	ug/kg	TAJ	12/08/04
Aroclor 1262	EPA 8082	< 25	ug/kg	TAJ	12/08/04
Aroclor 1260	EPA 8082	< 25	ug/kg	TAJ	12/08/04
Aroclor 1254	EPA 8082	< 25	ug/kg	TAJ	12/08/04
Aroclor 1248	EPA 8082	< 25	ug/kg	TAJ	12/08/04
Aroclor 1242/1016	EPA 8082	< 25	ug/kg	TAJ	12/08/04
Aroclor 1232	EPA 8082	< 25	ug/kg	TAJ	12/08/04
Aroclor 1221	EPA 8082	< 25	ug/kg	TAJ	12/08/04
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	40.2	% R	TAJ	12/08/04
***Tetrachloro-m-xylene	EPA 8082	48.0	% R	TAJ	12/08/04
***Decachlorobiphenyl	EPA 8082	56.4	% R	TAJ	12/08/04
***Decachlorobiphenyl	EPA 8082	80.8	% R	TAJ	12/08/04
Extraction	EPA 3541	1.0	DF	TAJ	12/06/04
PERCENT SOLID		92.2	%	TAJ	12/07/04

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
 QUALITY CONTROL SOLID

DATE EXTRACTED: 12/06/04

DATE ANALYZED: 12/07/04

METHOD BLANK	Concentration		Quantitation Limit
POLYCHLORINATED BIPHENYLS as AROCLORS	ug/kg-PPB		ug/kg-PPB
Aroclor 1262	ND		5.0
Aroclor 1260	ND		5.0
Aroclor 1254	ND		5.0
Aroclor 1248	ND		5.0
Aroclor 1242/1016	ND		5.0
Aroclor 1232	ND		5.0
Aroclor 1221	ND		5.0
Surrogates:	(A)	(B)	
Tetrachloro-m-xylene	111	121	30-150
Decachlorobiphenyl	112	124	30-150

LABORATORY CONTROL SAMPLE (LCS)	% Recovery		Acceptance Limits
Aroclor 1016	54.7	42.3	40-140
Aroclor 1260	62.8	83.2	40-140
Surrogates:			
Tetrachloro-m-xylene	101	106	30-150
Decachlorobiphenyl	110	121	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

GZA GEOENVIRONMENTAL, INC.  
 ENVIRONMENTAL CHEMISTRY LABORATORY  
 106 SOUTH STREET, HOPKINTON, MA 01748  
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS  
 QUALITY CONTROL SOLID

DATE EXTRACTED: 12/09/04

DATE ANALYZED: 12/10/04

METHOD BLANK	Concentration		Quantitation Limit
POLYCHLORINATED BIPHENYLS as AROCLORS	ug/kg-PPB		ug/kg-PPB
Aroclor 1262	ND		5.0
Aroclor 1260	ND		5.0
Aroclor 1254	ND		5.0
Aroclor 1248	ND		5.0
Aroclor 1242/1016	ND		5.0
Aroclor 1232	ND		5.0
Aroclor 1221	ND		5.0
<b>Surrogates:</b>	<b>(A)</b>	<b>(B)</b>	
Tetrachloro-m-xylene	129	118	30-150
Decachlorobiphenyl	124	115	30-150

LABORATORY CONTROL SAMPLE (LCS)	% Recovery		Acceptance Limits
Aroclor 1016	118	82.4	40-140
Aroclor 1260	126	101	40-140
<b>Surrogates:</b>			
Tetrachloro-m-xylene	123	126	30-150
Decachlorobiphenyl	124	124	30-150

\*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

071700

GZAP003



**GZA GeoEnvironmental, Inc.**  
**106 South Street**  
**Hopkinton, MA 01748**  
**(781) 278-4700**

Laboratory Identification Numbers:  
MA and ME: **MA092** NH: **2028**  
CT: **PH0579** RI: **LAO00236**  
NELAC - NYS DOH: **11063**

## **ANALYTICAL REPORT**

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project No.: **01.0013190.32**  
Work Order No.: **0705-00052**  
Date Received: **05/04/2007**  
Date Reported: **05/16/2007**

### **SAMPLE INFORMATION**

<b>Date Sampled</b>	<b>Matrix</b>	<b>Laboratory ID</b>	<b>Sample ID</b>
05/04/2007	Solid	0705-00052 001	SED - 301A
05/04/2007	Solid	0705-00052 002	SED - 302A
05/04/2007	Solid	0705-00052 003	SED - 303A
05/04/2007	Solid	0705-00052 004	SED - 304A
05/04/2007	Solid	0705-00052 005	SED - 305
05/04/2007	Solid	0705-00052 006	SED - 306
05/04/2007	Solid	0705-00052 007	SS - 301
05/04/2007	Solid	0705-00052 008	SS - 302
05/04/2007	Solid	0705-00052 009	SS - 303
05/04/2007	Solid	0705-00052 010	SS - 304





ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: **Wyman-Gordon W. Side PCB Area**  
Project No.: **01.0013190.32**

Date Received: **05/04/2007**  
Date Reported: **05/16/2007**  
Work Order No.: **0705-00052**

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PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 05/07/07 via \_\_GZA courier, \_\_EC, \_\_FEDEX, or \_\_x\_\_hand delivered.  
The samples were received intact for all requested analyses.

The following questions are answered upon sample receipt to determine compliance with MADEP Defined "Presumptive Certainty":

Were the samples received between 2-6 degrees C (Temperature = 2.1 degrees C)? (x) yes ( ) no  
\* The temperature requirement for most analyses is above freezing to 6 degrees C

Were the samples received with method specific preservatives within holding time? (x) yes ( ) no  
\* The chain of custody indicates that the samples, when required, were chemically preserved in accordance with the method they reference.

Were all constituents for the MCP Method(s) selected assigned on the COC? (x) yes ( ) no  
\* Full MCP14 Metals (x) yes ( ) no ( ) not assigned  
\* Full EPA 8270 SVOCs ( ) yes ( ) no (x) not assigned  
\* Full EPA 8260 or 8021 VOCs ( ) yes ( ) no (x) not assigned

2. EPA Method 6010B/7471A - Metals

Attach QC 6010B 05/09/07 A - Solid  
Attach QC 6010B 05/09/07 B - Solid  
Attach QC 7471A 05/07/07 B - Solid

3. EPA Method 8082 - PCBs

Attach QC 05/10/07 - Solid

The Laboratory Control Sample exceeded acceptance criteria for one analyte. The Matrix Spike and Duplicate Spike achieved all acceptance criteria and are included with the data report.

\* The sample indicate the presence of more than one Aroclor product. The PCB concentrations are estimates as some PCB congeners are contained in more than one Aroclor mixture.

\* The diluted out surrogate recoveries are due to interference from the type and concentration of petroleum present in the sample.



GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748  
(781) 278-4700

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ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: **Wyman-Gordon W. Side PCB Area**  
Project No.: **01.0013190.32**

Date Received: **05/04/2007**  
Date Reported: **05/16/2007**  
Work Order No.: **0705-00052**

MADEP MCP ANALYTICAL METHOD REPORT CERTIFICATION FORM:

*An affirmative response to the following three questions is required for "Presumptive Certainty" status.*

Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set? Yes ☒ No\* ☐

Were all QA/QC performance standards for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines? Yes ☒ No\* ☐

Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 of the MADEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? Yes ☒ No\* ☐

*A Response to the following two questions is required for "Presumptive Certainty" status.*

Were all QC performance standards and recommendations for the specified methods achieved? Yes ☐ No\* ☒

Were results for all analyte-list compounds/elements for the specified method(s) reported? Yes ☒ No\* ☐

*\* All Negative responses must be addressed in an attached Laboratory case narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:

Date: 5/16/07

Printed Name: **Andrew Yaroshewski**

Position: **Laboratory Supervisor**



GZA GeoEnvironmental, Inc.  
106 South Street  
Hopkinton, MA 01748  
(781) 278-4700

Page 4 of 14

## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: **Wyman-Gordon W. Side PCB Area**  
Project No.: **01.0013190.32**

Date Received: **05/04/2007**  
Date Reported: **05/16/2007**  
Work Order No.: **0705-00052**

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### LABORATORY STATEMENTS:

NELAC certification, as indicated by the NELAC ID Number, is per analyte. For a complete list of NELAC validated analytes, please contact the laboratory.

#### Abbreviations:

% R = % Recovery  
DF = Dilution Factor  
DO = Diluted Out

#### Method Key:

Method 8260: The current version of the method is 8260B.  
Method 8021: The current version of the method is 8021B.  
Method 8270: The current version of the method is 8270C.  
Method 6010: The current version of the method is 6010B.

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per method and are reported at the end of the analytical report if assigned on the Chain of Custody.



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: **Wyman-Gordon W. Side PCB Area**  
Project No.: **01.0013190.32**

Date Received: **05/04/2007**  
Date Reported: **05/16/2007**  
Work Order No.: **0705-00052**

Sample ID: **SED - 301A**

Sample No.: **001**

Sample Date: **05/04/2007**

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		30.0	%	TAJ	05/09/2007
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	05/14/2007
Aroclor 1268	EPA 8082	<2500	ug/kg	TAJ	05/14/2007
Aroclor 1262	EPA 8082	<2500	ug/kg	TAJ	05/14/2007
Aroclor 1260	EPA 8082	<2500	ug/kg	TAJ	05/14/2007
Aroclor 1254	EPA 8082	6200	ug/kg	TAJ	05/14/2007
Aroclor 1248	EPA 8082	<2500	ug/kg	TAJ	05/14/2007
Aroclor 1242/1016	EPA 8082	<2500	ug/kg	TAJ	05/14/2007
Aroclor 1232	EPA 8082	<2500	ug/kg	TAJ	05/14/2007
Aroclor 1221	EPA 8082	<2500	ug/kg	TAJ	05/14/2007
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	42.5	% R	TAJ	05/14/2007
***Tetrachloro-m-xylene	EPA 8082	40.7	% R	TAJ	05/14/2007
***Decachlorobiphenyl	EPA 8082	46.3	% R	TAJ	05/14/2007
***Decachlorobiphenyl	EPA 8082	42.6	% R	TAJ	05/14/2007
Extraction	EPA 3541	1.0	DF	TAJ	05/10/2007



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: **Wyman-Gordon W. Side PCB Area**  
Project No.: **01.0013190.32**

Date Received: **05/04/2007**  
Date Reported: **05/16/2007**  
Work Order No.: **0705-00052**

Sample ID: **SED - 302A**

Sample No.: **002**

Sample Date: **05/04/2007**

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		40.0	%	TAJ	05/09/2007
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	05/12/2007
Aroclor 1268	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1262	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1260	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1254	EPA 8082	360	ug/kg	TAJ	05/12/2007
Aroclor 1248	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1242/1016	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1232	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1221	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	72.1	% R	TAJ	05/12/2007
***Tetrachloro-m-xylene	EPA 8082	73.5	% R	TAJ	05/12/2007
***Decachlorobiphenyl	EPA 8082	68.2	% R	TAJ	05/12/2007
***Decachlorobiphenyl	EPA 8082	71.2	% R	TAJ	05/12/2007
Extraction	EPA 3541	1.0	DF	TAJ	05/10/2007



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: **Wyman-Gordon W. Side PCB Area**  
Project No.: **01.0013190.32**

Date Received: **05/04/2007**  
Date Reported: **05/16/2007**  
Work Order No.: **0705-00052**

Sample ID: **SED - 303A**

Sample No.: **003**

Sample Date: **05/04/2007**

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		59.9	%	TAJ	05/09/2007
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	05/12/2007
Aroclor 1268	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1262	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1260	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1254	EPA 8082	170	ug/kg	TAJ	05/12/2007
Aroclor 1248	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1242/1016	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1232	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Aroclor 1221	EPA 8082	<150	ug/kg	TAJ	05/12/2007
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	70.4	% R	TAJ	05/12/2007
***Tetrachloro-m-xylene	EPA 8082	71.1	% R	TAJ	05/12/2007
***Decachlorobiphenyl	EPA 8082	52.3	% R	TAJ	05/12/2007
***Decachlorobiphenyl	EPA 8082	54.0	% R	TAJ	05/12/2007
Extraction	EPA 3541	1.0	DF	TAJ	05/10/2007



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: Wyman-Gordon W. Side PCB Area  
Project No.: 01.0013190.32

Date Received: 05/04/2007  
Date Reported: 05/16/2007  
Work Order No.: 0705-00052

Sample ID: SED - 304A

Sample No.: 004

Sample Date: 05/04/2007

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		53.0	%	TAJ	05/09/2007
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	05/12/2007
Aroclor 1268	EPA 8082	<300	ug/kg	TAJ	05/12/2007
Aroclor 1262	EPA 8082	<300	ug/kg	TAJ	05/12/2007
Aroclor 1260	EPA 8082	<300	ug/kg	TAJ	05/12/2007
Aroclor 1254	EPA 8082	730	ug/kg	TAJ	05/12/2007
Aroclor 1248	EPA 8082	<300	ug/kg	TAJ	05/12/2007
Aroclor 1242/1016	EPA 8082	<300	ug/kg	TAJ	05/12/2007
Aroclor 1232	EPA 8082	<300	ug/kg	TAJ	05/12/2007
Aroclor 1221	EPA 8082	<300	ug/kg	TAJ	05/12/2007
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	66.8	% R	TAJ	05/12/2007
***Tetrachloro-m-xylene	EPA 8082	66.9	% R	TAJ	05/12/2007
***Decachlorobiphenyl	EPA 8082	86.8	% R	TAJ	05/12/2007
***Decachlorobiphenyl	EPA 8082	85.1	% R	TAJ	05/12/2007
Extraction	EPA 3541	1.0	DF	TAJ	05/10/2007



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: **Wyman-Gordon W. Side PCB Area**  
Project No.: **01.0013190.32**

Date Received: **05/04/2007**  
Date Reported: **05/16/2007**  
Work Order No.: **0705-00052**

Sample ID: **SED - 305**  
Sample Date: **05/04/2007**

Sample No.: **005**

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		25.7	%	TAJ	05/09/2007
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	05/12/2007
Aroclor 1268	EPA 8082	<700	ug/kg	TAJ	05/12/2007
Aroclor 1262	EPA 8082	<700	ug/kg	TAJ	05/12/2007
Aroclor 1260	EPA 8082	<700	ug/kg	TAJ	05/12/2007
Aroclor 1254	EPA 8082	2200	ug/kg	TAJ	05/12/2007
Aroclor 1248	EPA 8082	<700	ug/kg	TAJ	05/12/2007
Aroclor 1242/1016	EPA 8082	<700	ug/kg	TAJ	05/12/2007
Aroclor 1232	EPA 8082	<700	ug/kg	TAJ	05/12/2007
Aroclor 1221	EPA 8082	<700	ug/kg	TAJ	05/12/2007
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	66.9	% R	TAJ	05/12/2007
***Tetrachloro-m-xylene	EPA 8082	66.9	% R	TAJ	05/12/2007
***Decachlorobiphenyl	EPA 8082	46.2	% R	TAJ	05/12/2007
***Decachlorobiphenyl	EPA 8082	47.2	% R	TAJ	05/12/2007
Extraction	EPA 3541	1.0	DF	TAJ	05/10/2007
MCP METALS				AJY	05/10/2007
Silver	EPA 6010B	<0.72	mg/kg	AJY	05/10/2007
Arsenic	EPA 6010B	14	mg/kg	AJY	05/10/2007
Barium	EPA 6010B	64	mg/kg	AJY	05/10/2007
Beryllium	EPA 6010B	0.66	mg/kg	AJY	05/10/2007
Cadmium	EPA 6010B	<0.72	mg/kg	AJY	05/10/2007
Chromium	EPA 6010B	30	mg/kg	AJY	05/10/2007
Mercury	EPA 7471A	0.144	mg/kg	TGG	05/08/2007
Nickel	EPA 6010B	35	mg/kg	AJY	05/10/2007
Lead	EPA 6010B	95	mg/kg	AJY	05/10/2007
Antimony	EPA 6010B	<3.6	mg/kg	AJY	05/10/2007
Selenium	EPA 6010B	<3.6	mg/kg	AJY	05/10/2007
Thallium	EPA 6010B	<3.6	mg/kg	AJY	05/10/2007
Vanadium	EPA 6010B	150	mg/kg	AJY	05/10/2007
Zinc	EPA 6010B	290	mg/kg	AJY	05/10/2007
Metals Preparation	EPA 3051	37.0	DFS	AJY	05/09/2007





GZA GeoEnvironmental, Inc.  
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Hopkinton, MA 01748  
(781) 278-4700

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## ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: **Wyman-Gordon W. Side PCB Area**  
Project No.: **01.0013190.32**

Date Received: **05/04/2007**  
Date Reported: **05/16/2007**  
Work Order No.: **0705-00052**

Sample ID: **SED - 306**  
Sample Date: **05/04/2007**

Sample No.: **006**

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		75.1	%	TAJ	05/09/2007
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	05/15/2007
Aroclor 1268	EPA 8082	<800	ug/kg	TAJ	05/15/2007
Aroclor 1262	EPA 8082	<800	ug/kg	TAJ	05/15/2007
Aroclor 1260	EPA 8082	<800	ug/kg	TAJ	05/15/2007
Aroclor 1254	EPA 8082	2900	ug/kg	TAJ	05/15/2007
Aroclor 1248	EPA 8082	<800	ug/kg	TAJ	05/15/2007
Aroclor 1242/1016	EPA 8082	<800	ug/kg	TAJ	05/15/2007
Aroclor 1232	EPA 8082	<800	ug/kg	TAJ	05/15/2007
Aroclor 1221	EPA 8082	<800	ug/kg	TAJ	05/15/2007
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	74.6	% R	TAJ	05/15/2007
***Tetrachloro-m-xylene	EPA 8082	75.9	% R	TAJ	05/15/2007
***Decachlorobiphenyl	EPA 8082	104	% R	TAJ	05/15/2007
***Decachlorobiphenyl	EPA 8082	99.3	% R	TAJ	05/15/2007
Extraction	EPA 3541	1.0	DF	TAJ	05/10/2007



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: Wyman-Gordon W. Side PCB Area  
Project No.: 01.0013190.32

Date Received: 05/04/2007  
Date Reported: 05/16/2007  
Work Order No.: 0705-00052

Sample ID: SS - 301

Sample No.: 007

Sample Date: 05/04/2007

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		83.2	%	TAJ	05/09/2007
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	05/15/2007
Aroclor 1268	EPA 8082	<350	ug/kg	TAJ	05/15/2007
Aroclor 1262	EPA 8082	<350	ug/kg	TAJ	05/15/2007
Aroclor 1260	EPA 8082	370	ug/kg	TAJ	05/15/2007
Aroclor 1254	EPA 8082	<350	ug/kg	TAJ	05/15/2007
Aroclor 1248	EPA 8082	<350	ug/kg	TAJ	05/15/2007
Aroclor 1242/1016	EPA 8082	<350	ug/kg	TAJ	05/15/2007
Aroclor 1232	EPA 8082	<350	ug/kg	TAJ	05/15/2007
Aroclor 1221	EPA 8082	<350	ug/kg	TAJ	05/15/2007
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	75.2	% R	TAJ	05/15/2007
***Tetrachloro-m-xylene	EPA 8082	70.9	% R	TAJ	05/15/2007
***Decachlorobiphenyl	EPA 8082	73.4	% R	TAJ	05/15/2007
***Decachlorobiphenyl	EPA 8082	69.3	% R	TAJ	05/15/2007
Extraction	EPA 3541	1.0	DF	TAJ	05/10/2007
MCP METALS				AJY	05/10/2007
Silver	EPA 6010B	1.5	mg/kg	AJY	05/10/2007
Arsenic	EPA 6010B	15	mg/kg	AJY	05/10/2007
Barium	EPA 6010B	110	mg/kg	AJY	05/10/2007
Beryllium	EPA 6010B	<0.38	mg/kg	AJY	05/10/2007
Cadmium	EPA 6010B	1.1	mg/kg	AJY	05/10/2007
Chromium	EPA 6010B	190	mg/kg	AJY	05/10/2007
Mercury	EPA 7471A	1.59	mg/kg	TGG	05/10/2007
Nickel	EPA 6010B	330	mg/kg	AJY	05/10/2007
Lead	EPA 6010B	280	mg/kg	AJY	05/10/2007
Antimony	EPA 6010B	<2.4	mg/kg	AJY	05/10/2007
Selenium	EPA 6010B	<2.4	mg/kg	AJY	05/10/2007
Thallium	EPA 6010B	<2.4	mg/kg	AJY	05/10/2007
Vanadium	EPA 6010B	28	mg/kg	AJY	05/10/2007
Zinc	EPA 6010B	1400	mg/kg	AJY	05/10/2007
Metals Preparation	EPA 3051	80.0	DFS	AJY	05/09/2007



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: **Wyman-Gordon W. Side PCB Area**  
Project No.: **01.0013190.32**

Date Received: **05/04/2007**  
Date Reported: **05/16/2007**  
Work Order No.: **0705-00052**

Sample ID: **SS - 302**

Sample No.: **008**

Sample Date: **05/04/2007**

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		80.8	%	TAJ	05/09/2007
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	05/15/2007
Aroclor 1268	EPA 8082	<300	ug/kg	TAJ	05/15/2007
Aroclor 1262	EPA 8082	<300	ug/kg	TAJ	05/15/2007
Aroclor 1260	EPA 8082	460*	ug/kg	TAJ	05/15/2007
Aroclor 1254	EPA 8082	480*	ug/kg	TAJ	05/15/2007
Aroclor 1248	EPA 8082	<300	ug/kg	TAJ	05/15/2007
Aroclor 1242/1016	EPA 8082	<300	ug/kg	TAJ	05/15/2007
Aroclor 1232	EPA 8082	<300	ug/kg	TAJ	05/15/2007
Aroclor 1221	EPA 8082	<300	ug/kg	TAJ	05/15/2007
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	73.2	% R	TAJ	05/15/2007
***Tetrachloro-m-xylene	EPA 8082	73.4	% R	TAJ	05/15/2007
***Decachlorobiphenyl	EPA 8082	77.8	% R	TAJ	05/15/2007
***Decachlorobiphenyl	EPA 8082	76.6	% R	TAJ	05/15/2007
Extraction	EPA 3541	1.0	DF	TAJ	05/10/2007
MCP METALS				AJY	05/10/2007
Silver	EPA 6010B	<0.43	mg/kg	AJY	05/10/2007
Arsenic	EPA 6010B	49	mg/kg	AJY	05/10/2007
Barium	EPA 6010B	38	mg/kg	AJY	05/10/2007
Beryllium	EPA 6010B	<0.34	mg/kg	AJY	05/10/2007
Cadmium	EPA 6010B	<0.43	mg/kg	AJY	05/10/2007
Chromium	EPA 6010B	29	mg/kg	AJY	05/10/2007
Mercury	EPA 7471A	0.0444	mg/kg	TGG	05/08/2007
Nickel	EPA 6010B	36	mg/kg	AJY	05/10/2007
Lead	EPA 6010B	44	mg/kg	AJY	05/10/2007
Antimony	EPA 6010B	<2.1	mg/kg	AJY	05/10/2007
Selenium	EPA 6010B	<2.1	mg/kg	AJY	05/10/2007
Thallium	EPA 6010B	<2.1	mg/kg	AJY	05/10/2007
Vanadium	EPA 6010B	27	mg/kg	AJY	05/10/2007
Zinc	EPA 6010B	190	mg/kg	AJY	05/10/2007
Metals Preparation	EPA 3051	69.3	DFS	AJY	05/09/2007



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: Wyman-Gordon W. Side PCB Area  
Project No.: 01.0013190.32

Date Received: 05/04/2007  
Date Reported: 05/16/2007  
Work Order No.: 0705-00052

Sample ID: SS - 303

Sample No.: 009

Sample Date: 05/04/2007

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		83.3	%	TAJ	05/09/2007
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	05/15/2007
Aroclor 1268	EPA 8082	<170000	ug/kg	TAJ	05/15/2007
Aroclor 1262	EPA 8082	<170000	ug/kg	TAJ	05/15/2007
Aroclor 1260	EPA 8082	<170000	ug/kg	TAJ	05/15/2007
Aroclor 1254	EPA 8082	430000	ug/kg	TAJ	05/15/2007
Aroclor 1248	EPA 8082	<170000	ug/kg	TAJ	05/15/2007
Aroclor 1242/1016	EPA 8082	<170000	ug/kg	TAJ	05/15/2007
Aroclor 1232	EPA 8082	<170000	ug/kg	TAJ	05/15/2007
Aroclor 1221	EPA 8082	<170000	ug/kg	TAJ	05/15/2007
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	DO	% R	TAJ	05/15/2007
***Tetrachloro-m-xylene	EPA 8082	DO	% R	TAJ	05/15/2007
***Decachlorobiphenyl	EPA 8082	DO	% R	TAJ	05/15/2007
***Decachlorobiphenyl	EPA 8082	DO	% R	TAJ	05/15/2007
Extraction	EPA 3541	1.0	DF	TAJ	05/10/2007
MCP METALS				AJY	05/10/2007
Silver	EPA 6010B	<0.58	mg/kg	AJY	05/10/2007
Arsenic	EPA 6010B	21	mg/kg	AJY	05/10/2007
Barium	EPA 6010B	36	mg/kg	AJY	05/10/2007
Beryllium	EPA 6010B	<0.47	mg/kg	AJY	05/10/2007
Cadmium	EPA 6010B	<0.58	mg/kg	AJY	05/10/2007
Chromium	EPA 6010B	28	mg/kg	AJY	05/10/2007
Mercury	EPA 7471A	<0.0264	mg/kg	TGG	05/08/2007
Nickel	EPA 6010B	23	mg/kg	AJY	05/10/2007
Lead	EPA 6010B	29	mg/kg	AJY	05/10/2007
Antimony	EPA 6010B	<2.9	mg/kg	AJY	05/10/2007
Selenium	EPA 6010B	<2.9	mg/kg	AJY	05/10/2007
Thallium	EPA 6010B	<2.9	mg/kg	AJY	05/10/2007
Vanadium	EPA 6010B	38	mg/kg	AJY	05/10/2007
Zinc	EPA 6010B	77	mg/kg	AJY	05/10/2007
Metals Preparation	EPA 3051	96.9	DFS	AJY	05/09/2007



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, MA 02062

Tim Briggs

Project Name.: Wyman-Gordon W. Side PCB Area  
Project No.: 01.0013190.32

Date Received: 05/04/2007  
Date Reported: 05/16/2007  
Work Order No.: 0705-00052

Sample ID: SS - 304

Sample No.: 010

Sample Date: 05/04/2007

Test Performed	Method	Results	Units	Tech	Analysis Date
PERCENT SOLID		82.8	%	TAJ	05/09/2007
POLYCHLORINATED BIPHENYLS	EPA 8082			TAJ	05/15/2007
Aroclor 1268	EPA 8082	<12000	ug/kg	TAJ	05/15/2007
Aroclor 1262	EPA 8082	<12000	ug/kg	TAJ	05/15/2007
Aroclor 1260	EPA 8082	<12000	ug/kg	TAJ	05/15/2007
Aroclor 1254	EPA 8082	35000	ug/kg	TAJ	05/15/2007
Aroclor 1248	EPA 8082	<12000	ug/kg	TAJ	05/15/2007
Aroclor 1242/1016	EPA 8082	<12000	ug/kg	TAJ	05/15/2007
Aroclor 1232	EPA 8082	<12000	ug/kg	TAJ	05/15/2007
Aroclor 1221	EPA 8082	<12000	ug/kg	TAJ	05/15/2007
Surrogates:	EPA 8082				
***Tetrachloro-m-xylene	EPA 8082	71.8	% R	TAJ	05/15/2007
***Tetrachloro-m-xylene	EPA 8082	73.0	% R	TAJ	05/15/2007
***Decachlorobiphenyl	EPA 8082	116	% R	TAJ	05/15/2007
***Decachlorobiphenyl	EPA 8082	108	% R	TAJ	05/15/2007
Extraction	EPA 3541	1.0	DF	TAJ	05/10/2007
MCP METALS				AJY	05/10/2007
Silver	EPA 6010B	<0.59	mg/kg	AJY	05/10/2007
Arsenic	EPA 6010B	16	mg/kg	AJY	05/10/2007
Barium	EPA 6010B	130	mg/kg	AJY	05/10/2007
Beryllium	EPA 6010B	<0.48	mg/kg	AJY	05/10/2007
Cadmium	EPA 6010B	<0.59	mg/kg	AJY	05/10/2007
Chromium	EPA 6010B	25	mg/kg	AJY	05/10/2007
Mercury	EPA 7471A	0.0666	mg/kg	TGG	05/08/2007
Nickel	EPA 6010B	23	mg/kg	AJY	05/10/2007
Lead	EPA 6010B	120	mg/kg	AJY	05/10/2007
Antimony	EPA 6010B	<3.0	mg/kg	AJY	05/10/2007
Selenium	EPA 6010B	<3.0	mg/kg	AJY	05/10/2007
Thallium	EPA 6010B	<3.0	mg/kg	AJY	05/10/2007
Vanadium	EPA 6010B	17	mg/kg	AJY	05/10/2007
Zinc	EPA 6010B	250	mg/kg	AJY	05/10/2007
Metals Preparation	EPA 3051	98.4	DFS	AJY	05/09/2007

ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 6010B ANALYSIS**  
**Metals by ICP**

**QUALITY CONTROL - SOLID**

**DATE PREPARED: 5/9/2007 A**

QC Sample	Method Blank	Lab Control Sample
Units	mg/kg	% Recovery
Acceptance Limits	Results	80-120
<b>Analyte</b>		
Silver (Ag)	<0.500	87.3
Aluminum (Al)	NA	NA
Arsenic (As)	<1.00	90.6
Boron (B)	NA	NA
Barium (Ba)	<0.500	97.9
Beryllium (Be)	<0.400	94.5
Calcium (Ca)	NA	NA
Cadmium (Cd)	<0.500	96.3
Cobalt (Co)	NA	NA
Chromium (Cr)	<0.500	99.1
Copper (Cu)	<1.50	104
Iron (Fe)	NA	NA
Magnesium (Mg)	NA	NA
Manganese (Mn)	NA	NA
Molybdenum (Mo)	NA	NA
Nickel (Ni)	<1.00	97.6
Lead (Pb)	<1.00	96.2
Antimony (Sb)	<2.50	93.4
Selenium (Se)	<2.50	80.4
Strontium (Sr)	NA	NA
Titanium (Ti)	NA	NA
Thallium (Tl)	<2.50	92.4
Vanadium (V)	<0.500	97.3
Zinc (Zn)	<1.00	104

Matrix Spike / Duplicate Spike performed as per method and  
reported if assigned on Chain of Custody.

ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 6010B ANALYSIS  
Metals by ICP

QUALITY CONTROL - SOLID

DATE PREPARED: 5/9/2007 B

QC Sample Units	Method Blank mg/kg	Lab Control Sample % Recovery
Acceptance Limits	Results	80-120
<b>Analyte</b>		
Silver (Ag)	<0.500	85.9
Aluminum (Al)	NA	NA
Arsenic (As)	<1.00	89.2
Boron (B)	NA	NA
Barium (Ba)	<0.500	96.1
Beryllium (Be)	<0.400	93.9
Calcium (Ca)	NA	NA
Cadmium (Cd)	<0.500	96.2
Cobalt (Co)	NA	NA
Chromium (Cr)	<0.500	98.4
Copper (Cu)	<1.50	104
Iron (Fe)	NA	NA
Magnesium (Mg)	NA	NA
Manganese (Mn)	NA	NA
Molybdenum (Mo)	NA	NA
Nickel (Ni)	<1.00	96.6
Lead (Pb)	<1.00	96.3
Antimony (Sb)	<2.50	93.4
Selenium (Se)	<2.50	80.0
Strontium (Sr)	NA	NA
Titanium (Ti)	NA	NA
Thallium (Tl)	<2.50	92.5
Vanadium (V)	<0.500	96.0
Zinc (Zn)	<1.00	102

Matrix Spike / Duplicate Spike performed as per method and  
reported if assigned on Chain of Custody.

GZA GEOENVIRONMENTAL, INC.  
ENVIRONMENTAL CHEMISTRY LABORATORY  
106 SOUTH ST, HOPKINTON, MA 01748  
MASSACHUSETTS LABORATORY I.D. NO. MA092

**EPA METHOD 7471A ANALYSIS**  
**Mercury by Cold Vapor Atomic Absorption**

**QUALITY CONTROL - Solid**

**Date Prepared: 05/07/07 B**

QC Sample	Method Blank	Lab Control Sample
Units	mg/kg	% Recovery
Acceptance Limits	Results	85-115
<b>Analyte</b>		
Mercury (Hg)	<0.025 (Sol)	110

Matrix Spike / Duplicate Spike performed as per method and reported if assigned on Chain of Custody.



**GZA GEOENVIRONMENTAL, INC.**  
**ENVIRONMENTAL CHEMISTRY LABORATORY**  
**106 SOUTH STREET, HOPKINTON, MA 01748**  
**MASSACHUSETTS LABORATORY I.D. NO. MA092**

**EPA METHOD 8082 ANALYSIS**  
**QUALITY CONTROL SOLID**

**DATE EXTRACTED: 05/10/07**

**DATE ANALYZED: 05/12/07**

<b>METHOD BLANK</b>	<b>Concentration</b>		<b>Quantitation Limit</b>
<b>POLYCHLORINATED BIPHENYLS as AROCLORS</b>	<b>ug/kg-PPB</b>		<b>ug/kg-PPB</b>
Aroclor 1262	ND		25
Aroclor 1260	ND		25
Aroclor 1254	ND		25
Aroclor 1248	ND		25
Aroclor 1242/1016	ND		25
Aroclor 1232	ND		25
Aroclor 1221	ND		25
<b>Surrogates:</b>	<b>(A)</b>	<b>(B)</b>	
Tetrachloro-m-xylene	87.6	87.7	30-150
Decachlorobiphenyl	97.6	95.8	30-150

<b>LABORATORY CONTROL SAMPLE (LCS)</b>	<b>% Recovery</b>		<b>Acceptance Limits</b>
Aroclor 1016	128	130	40-140
Aroclor 1260	144	143	40-140
<b>Surrogates:</b>			
Tetrachloro-m-xylene	103	102	30-150
Decachlorobiphenyl	110	108	30-150

\*LCS recoveries exceed acceptance criteria for one analyte, however the Matrix Spike / Duplicate Spike meet all acceptance criteria and are included with this data report.

**Matrix Spike Sample ID: TP-501 Comp**  
**Matrix Spike LIMS ID: 0705-00063-001**

<b>MATRIX SPIKE SAMPLE</b>	<b>% Recovery</b>		<b>Acceptance Limits</b>
Aroclor 1016	96.6	88.6	40-140
Aroclor 1260	90.8	80.5	40-140
Tetrachloro-m-xylene	73.9	73.6	30-150
Decachlorobiphenyl	74.3	70.4	30-150

<b>MATRIX SPIKE DUPLICATE</b>	<b>% Recovery</b>		<b>Acceptance Limits</b>
Aroclor 1016	93.4	85.4	40-140
Aroclor 1260	95.9	94.7	40-140
<b>Surrogates:</b>			
Tetrachloro-m-xylene	64.0	63.7	30-150
Decachlorobiphenyl	57.5	53.4	30-150

<b>RELATIVE PERCENT DIFFERENCE (RPD)</b>	<b>RPD</b>		<b>Acceptance Limits</b>
Aroclor 1016	3.37	3.68	50
Aroclor 1260	5.46	16.2	50

GZAP003

[illegible]



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O. Box 418, Manchester, CT 06040  
Tel. (860) 845-1102 Fax (860) 845-0823

# Analysis Report

December 30, 2000

FOR: Attn: Mr. Mike Lotti  
GZA GenEnvironmental Inc  
One Edgewater Drive  
Norwood, MA 02062

## Sample Information

Matrix: WATER  
Location Code: GZA-MA  
Project Code: RUSH#  
P.O.#:

## Custody Information

Collected by:  
Received by: SW  
Analyzed by: see below

Date Time  
12/26/00 13:21  
12/26/00 17:45

## Laboratory Data

Client ID: WYMAN GORDON WGW-7

Parameter	Result	RL	Units	Date	Time	by	Phoenix I.D. AD07160 Reference
Arsenic (Dissolved)	0.020	0.004	mg/L	12/28/00	14:46	RS	200.9
Mercury (Dissolved)	BDL	0.0002	mg/L	12/27/00	10:26	RS	SW-7470
Lead (Dissolved)	BDL	0.001	mg/L	12/27/00	0:26	RS	7421/239.2
Antimony (Dissolved)	BDL	0.005	mg/L	12/28/00	14:39	PS	7041/E204.2
Selenium (Dissolved)	BDL	0.005	mg/L	12/27/00	8:48	RS	SW7741/270.
Thallium (Dissolved)	BDL	0.005	mg/L	12/28/00	14:39	PS	279.2
Silver (Dissolved)	BDL	0.001	mg/L	12/27/00	11:26	EK	6010/E200.7
Aluminum (Dissolved)	0.05	0.03	mg/L	12/27/00	11:26	EK	6010/E200.7
Barium (Dissolved)	0.18	0.01	mg/L	12/27/00	11:26	EK	6010/E200.7
Beryllium (Dissolved)	BDL	.01	mg/L	12/27/00	11:26	EK	6010/E200.7
Cadmium (Dissolved)	BDL	0.005	mg/L	12/27/00	11:26	EK	6010/E200.7
Chromium (Dissolved)	BDL	0.01	mg/L	12/27/00	11:26	EK	6010/E200.7
Copper (Dissolved)	BDL	0.001	mg/L	12/27/00	11:26	EK	6010/E200.7
Magnesium (Dissolved)	54.8	0.10	mg/L	12/27/00	11:26	EK	6010/E200.7
Nickel (Dissolved)	BDL	0.005	mg/L	12/27/00	18:26	EK	6010/E200.7
Zinc (Dissolved)	BDL	0.005	mg/L	12/27/00	11:26	EK	6010/E200.7
MA Petroleum Hydrocarbon (EPH)	Completed	5.0	ug/L	12/27/00	11:26	EK	6010/E200.7
Dissolved Mercury Digestion	Completed	NA	NA	12/28/00	10:36	OL	MAEPH
PCB Extraction	Completed			12/27/00	8:47	DD	SW7470
Dissolved Metals Digestion	Completed			12/26/00	10:20	PL	SW848-3510
				12/26/00	20:47	AB	SW846-3005

Parameter	Result	RL	Units	Date	Time	by	Reference
<b><u>Polychlorinated Biphenyls</u></b>							
PCB-1016	ND	0.5	ug/L	12/27/00	16:54	CN	SW8082
PCB-1221	ND	0.5	ug/L	12/27/00	16:54	CN	SW8082
PCB-1232	ND	0.5	ug/L	12/27/00	16:54	CN	SW8082
PCB-1242	ND	0.5	ug/L	12/27/00	16:54	CN	SW8082
PCB-1248	ND	0.5	ug/L	12/27/00	16:54	CN	SW8082
PCB-1254	ND	0.5	ug/L	12/27/00	16:54	CN	SW8082
PCB-1260	ND	0.5	ug/L	12/27/00	16:54	CN	SW8082
PCB-1282	ND	0.5	ug/L	12/27/00	16:54	CN	SW8082
PCB-1268	ND	0.5	ug/L	12/27/00	16:54	CN	SW8082
<b><u>Volatile Water</u></b>							
1,1,1,2-Tetrachloroethane	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,1,1-Trichloroethane	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,1,2,2-Tetrachloroethane	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,1,2-Trichloroethane	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,1-Dichloroethane	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,1-Dichloroethane	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,1-Dichloropropene	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,2,3-Trichlorobenzene	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,2,3-Trichloropropane	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,2,4-Trichlorobenzene	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,2,4-Trimethylbenzene	ND	5	ug/L	12/27/00	16:28	KCA	SV
1,2-Dibromo-3-chloropropane	ND	5	ug/L	12/27/00	16:28	KCA	S
1,2-Dibromoethane	ND	5	ug/L	12/27/00	16:28	KCA	f
1,2-Dichlorobenzene	ND	5	ug/L	12/27/00	16:28	KCA	
1,2-Dichloroethane	ND	5	ug/L	12/27/00	16:28	KCA	
1,2-Dichloropropane	ND	5	ug/L	12/27/00	16:28	KCA	
1,3,5-Trimethylbenzene	ND	5	ug/L	12/27/00	16:28	KCA	
1,3-Dichlorobenzene	ND	5	ug/L	12/27/00	16:28	KC	
1,3-Dichloropropane	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
1,4-Dichlorobenzene	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
2,2-Dichloropropane	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
2-Chlorotoluene	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
4-Chlorotoluene	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
Benzene	ND	5	ug/L	12/27/00	16:28	KCA	SW8260
Bromobenzene	ND	5	ug/L	12/27/00	16:28	KCA	SW8260



(for lab use only)

Sample ID.	Date/Time Sampled (Very Important)	Matrix	ANALYSIS REQUIRED										Total # of Cont.	Notes		
			GW ONLY	GC Screen (VOC)	GC 24.2	GC 24.2	GC 24.2	GC 24.2	GC 24.2	GC 24.2	GC 24.2	GC 24.2				
PUMP HOUSE 1	10:48 am	GW														
PUMP HOUSE 2	10:25 am															
PUMP HOUSE 3	10:00 am															
PUMP HOUSE 4	9:20 am															
WG W-1	12:48															
WG W-7	13:21															
WG W-5	13:44															
WG W-50	14:20															

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME
Sean Kearney	12/26/00	Mike Letti	12/26/00

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME
Mike Letti	12/26/00	Sean Kearney	12/26/00

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Mike Letti	12/26/00	Sean Kearney	12/26/00

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Mike Letti	12/26/00	Sean Kearney	12/26/00</



**APPENDIX C**  
**CONFIRMATORY SAMPLING PROGRAM**

## APPENDIX C

### WEST PCB AREA CONFIRMATORY SAMPLING PROGRAM

This Appendix C briefly summarizes the proposed excavation strategy in the wetland and upland areas of the West PCB Area, and outlines the confirmatory sampling program to document that the target clean-up levels have been met. The confirmatory sampling program was developed in accordance with Subpart O, with the exception that the grid spacing has been increased due to the large area of the proposed remediation areas.

Wetland Soil Excavation: Within the wetland portion of the West PCB Area, wetland soil will be excavated to remove material with total PCB concentrations greater than 9.5 mg/kg. The horizontal limit of the wetland remediation area encompasses all wetland soil sample locations that contained total PCB concentrations above 9.5 mg/kg. Based on field observations and analytical data for the wetland, PCB concentrations above 9.5 mg/kg appear to be limited to the surficial peaty muck layer, which generally occupies the top 30 inches. Subsoil below the peat is well consolidated sandy clay loam. It is expected that removal of the peat over the 5,283 sq.ft. wetland remediation area will eliminate materials with PCB concentrations above the clean-up goal. Within the delineated remediation area, the peaty soil will be removed down to the mineral sub-soil, and at that point the confirmatory sampling program outlined below will be initiated. Additional excavation will be performed if needed based on the confirmatory sampling data.

Upland Soil Excavation: Within the upland portion of the West PCB area, soil will be excavated as needed to remove material with total PCB concentrations greater than 25 mg/kg. Visibly oily fill and debris are present in the excavation area adjacent to the wetland. The excavation adjacent to the wetland will be advanced to the depth necessary to remove visible oily fill and debris (this is estimated to be about 6 feet below ground surface (bgs)). Within areas that do not contain visible oily fill or debris, the soil with concentrations above 25 mg/kg are generally limited to the top 1 foot bgs, however, there are patches at which the initial excavation will extent to 2 feet bgs (see Figure 3 in the main report). At that point the confirmatory sampling program outlined below will be initiated. Additional excavation will be performed if needed based on the confirmatory sampling data.

Confirmatory Sampling Program: Confirmatory sampling for the wetland and upland excavations will be performed on a 25-foot grid, and with 25-foot spacing along the excavation side-walls. Figure C-1 presents the general lay-out for 25-foot grids within the proposed excavation areas. The grids have been position so that there are at least 2 sampling nodes across the width of each excavation area. The side wall samples will also be placed so that they are approximately at the intersections of the grid lines and the sidewalls. However, where spacing between the intersection points of grid lines and side walls is less than 25 feet (as measured along the side wall), the sample will be collected mid-way between the intersection points. Based on this lay out, and assuming the ultimate extents of the excavation areas are similar to those shown on Figure C1, we anticipate that the final confirmatory sampling count (i.e., the sampling that established acceptable conditions) will consist of approximately 120 samples.



When initial excavation depths are reached within an area (as outlined above) the confirmatory sampling will proceed in an iterative manner. The initial sampling will be conducted by laying out the 25-foot grid and marking the nodes and side wall sampling points with stakes and flagging. A subset (on the order of 25 to 50 percent) of the grid nodes and sidewall sampling points will be sampled for laboratory analyses of PCBs. If no exceedances are detected, the remainder of the grid node samples and sidewall samples will be collected and analyzed for PCBs. Note that these initial PCB analyses may be performed using field screening tests as allowed for in 40 C FR 761.61(a)(6), however, the final confirmatory sampling data will be obtained via SW 846, Method 8082/3540C. Matrix spike and matrix spike duplicates will be collected at a rate of one per day, or one per batch of 20 samples, whichever is greater. Acceptance criteria will be 30 to 150 percent recovery, and a relative percent difference of 30 percent.

At anytime during this iterative sampling effort samples are encountered that exceed the clean-up goals, additional excavation will be conducted at that exceeding sampling point, and will extend at least half the distance to nearest samples with acceptable PCB concentrations. These targeted secondary excavations will extend approximately one foot below, or further outward (if detected in a sample from the edge of the excavation) from the level at which the exceedance was detected. However the secondary excavations may be deeper or more shallow if field observations indicate a change in material characteristics.

Grids established within areas that have been re-cleaned (i.e., following secondary or subsequent excavations) will be shifted 12.5 feet toward magnetic north, and 12.5 feet eastward. The new, re-cleaned subgrade will then be sampled on a 25-foot grid. Note that following secondary or subsequent excavations only the floor of the excavation will be sampled. The sidewalls of the excavation will be sampled only if visible clues suggest that there may be elevated PCB levels associated with sidewall material (e.g., visible refuse or oily soil). All confirmatory sampling locations will be located in the field using a precision Differentially Corrected Global Positioning System unit.

This process will continue until each node of the grid and sidewall sampling location has been documented to contain less than the 25 mg/kg (upland soil) or 9.5 mg/kg (wetland soil) clean-up goals.

#### Measurement And Quality Objectives:

Analytical results will be compared to target remediation objectives, namely;

Upland Soil:  $\geq 50$  mg/kg off-Site disposal,  $> 25$  mg/kg consolidation under cap,  $\leq 25$  mg/kg can remain in place.

Wetland Soil:  $\geq 50$  mg/kg off-Site disposal,  $\geq 9.5$  mg/kg consolidation under cap,  $< 9.5$  mg/kg can remain in place.

Documentation and Records, Field: A permanently bound field notebook with individually numbered pages will be maintained to record field sampling activities. Entries into the notebook will be made with permanent ink; corrections will be made using a single line through the error; the initials of the individual who made the correction and date of the correction will be noted adjacent to the correction. Entries will include sampling location, time, date, weather conditions, field measurements taken, and unusual events or problems encountered during sampling.

Care will be taken in preparing the labels for the sample containers and in preparing the Chain of Custody (COC) form. The sample identification and information on the sample labels will be compared to the information on the COC to check for consistency.

Documentation and Records, Laboratory: In the laboratory, the samples are received by the sample custodian and promptly entered into the laboratory's Laboratory Information Management System (LIMS). The documentation generated includes the signed COC, a Sample Receipt Checklist, and a printed Sample Receipt documenting the requested analyses. This information specific to the COC is filed as a unique laboratory project number. The raw data for the associated samples are included in this file. Batch QC specific to the project is filed by analysis date as it may apply to more than one COC defined project. The LIMS system retains the information and is backed up daily. The COC defined projects with associated raw data and daily QC are kept on site at the laboratory for six months. After six months, the raw data is moved to off-site storage. The laboratory notebooks documenting actual sample measurements and preparation steps are kept on site for approximately two years after which time the logbooks are moved to off-site storage. The sample information and raw data may be re-constructed upon request allowing time to retrieve off-site documents.

Following analysis and final data review, the project data will be summarized in an analytical report. The analytical report will contain the following information: (1) Project Name; (2) sample identification; (3) sample matrix; (4) sample preparation and/or analysis date; (5) name, address, and phone number of lab; (6) sample collection date/time; (7) sample receipt date; (8) analytical method reference; (9) a list of parameters; (10) the analytical results; (11) the unit of measurement; and (12) the reporting limit for each non-detect parameter.

The types of information that the laboratory will provide include:

- a) Sample Summary;
- b) Project Narrative documenting receipt and QC exceptions;
- c) Presumptive Certainty Statement (see Sample Report, Appendix C);
- d) Sample Data Results Sheets;
- e) Surrogate Recoveries;
- f) Method Blank Results;
- g) Matrix Spike/Matrix Spike Duplicate Results and Acceptance Limits, if applicable; and
- h) Laboratory Control Sample Results and Acceptance Limits.

The reports are generated in Adobe PDF form. Electronic sample data results will also be provided.

The following documentation will be maintained by the laboratory to respond to future requests for information:

- a) Hardcopy of final report sent;
- b) Raw instrument data;
- c) Analytical instrument logbooks; and
- d) Chain-of-custody and sample receipt documentation.

Sampling and Analytical Method Requirements: As noted above, soil samples will be analyzed for PCBs via SW 846, Method 8082/3540C. Analytical methods, sample containers and preservatives, and holding times are summarized below.

Type of Analysis/Method	Container and Preservative (Quantity in parentheses)	Holding Time (from date of sampling)
<b>Polychlorinated Biphenyls</b>		
Soil	(1) 8 ounce amber glass jar	none

Sample Handling and Custody Procedures: The samples will be tracked from collection, through shipment, to laboratory receipt, and during laboratory custody by using a COC form provided by the analytical laboratory. The COC will be signed and dated by all individuals who are responsible for the samples with the final signature being the laboratory's sample custodian. The original COC will be kept in laboratory project file attached to the laboratory analytical report. Copies of the COC are also provided to the project manager.

Labels providing the following information will be affixed to the sample containers in the field: site location, the sample ID (location), the sampling date/time, the analysis required, and the name of the sample collector. The sampling date and time of each sample will be recorded by the sampler on the COC. The holding times will be checked to ensure samples are transported in a timely manner and are able to be extracted and/or analyzed within the appropriate holding times. The required holding time for each test can be found above.

Sample custody will be documented to support the data quality objectives. Samples will be packed into a cooler containing sufficient ice to maintain the temperature between 2 and 6 degrees Celsius during delivery to the laboratory. The cooler (with the COC) will be transported to the laboratory under Custody Seal by GZA personnel or courier

Upon receipt at the laboratory, the samples will be inspected by the Sample Controller, or other qualified laboratory personnel. The Sample Receipt Checklist (SRC), which will be used to document the receipt of the samples, a check for breakage, confirmation that the appropriate container and preservative were used for each sample submitted for analysis; the temperature of the cooler, sample holding time, and other factors that may affect sample quality. The samples will be compared to their descriptions on the COC form; discrepancies in the number or the designations of the samples will be noted on the form, brought to the attention of the Project Manager, and resolved at the Site team's instruction. The COC form will be signed and the date and time recorded to formally accept the samples into laboratory custody.

The laboratory will send a copy of the COC, along with an analytical assignment receipt, to the GZA project manager for his review. The original COC form will be retained in the laboratory's files. Additional copies will be retained by project personnel to provide supplemental direction to the laboratory staff.

Once samples have been labeled with unique laboratory identification numbers, they will be placed in specific refrigerators. Refrigerator temperatures will be maintained between 2 and 6 degrees Celsius and will be monitored each business day.

Analytical Method Requirements:

Parameter	Method Source and Number	Reporting Units	Modifications or options
PCBs	USEPA Method 8082	µg/kg (soil)	Specify Manual Soxhlet Extraction by USEPA Method 3540C

Quality Control Parameters:

A. Field QC Checks

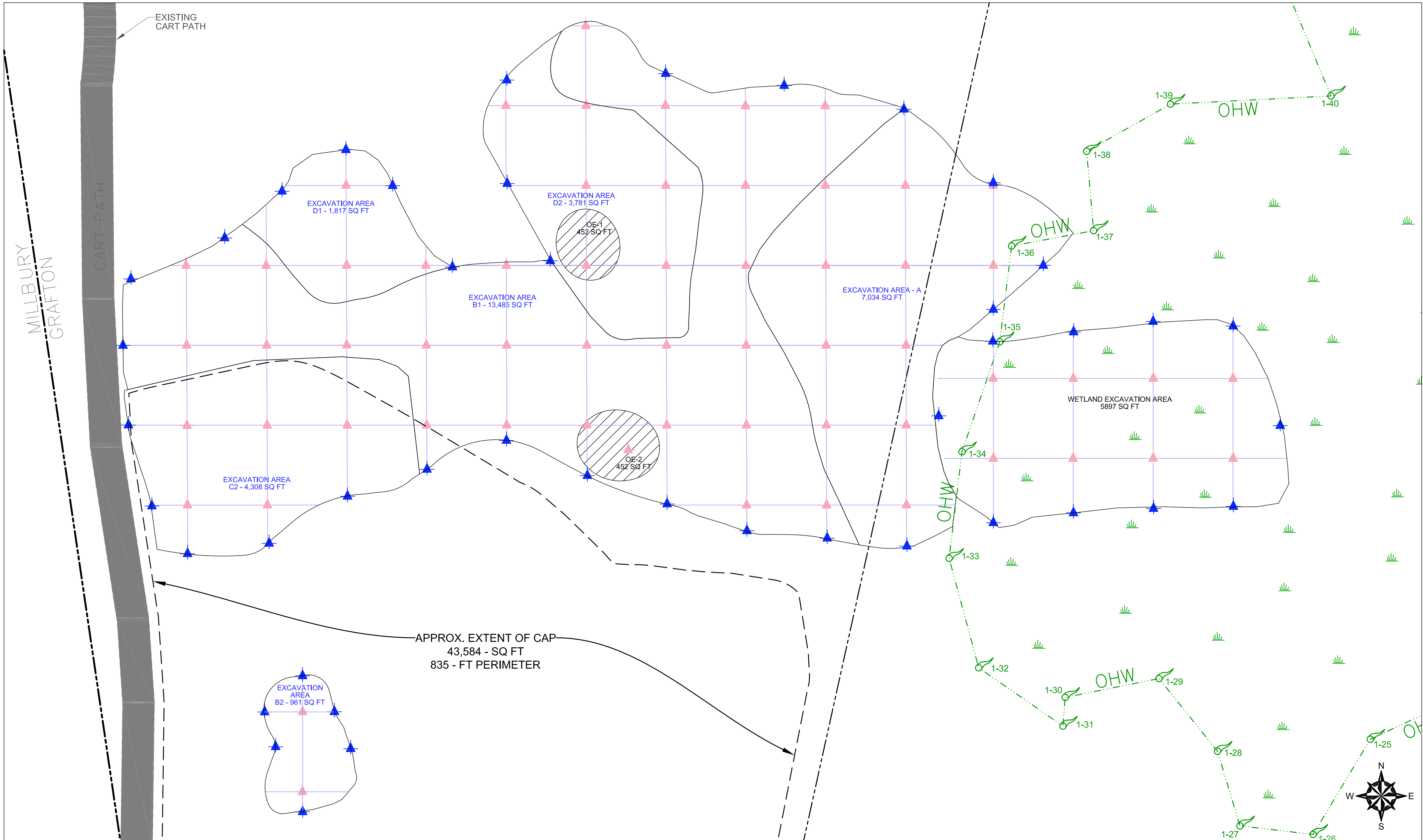
QC Sample	Frequency	Acceptance Criteria	Corrective Action
Duplicate	1 per day, or 1 per 20 samples, which ever is greater	USEPA Method 8082 RPD $\leq$ 30% for pair	Flag results in the Precision Statement
Matix Spike/Matrix Spike Duplicate	1 set per day, or 1 set per 20 samples, which ever is greater	USEPA Method 8082 RPD $\leq$ 30% for pair, Percent Recovery 40 – 140%	Flag results in the Precision Statement
Cooler Temperature Blank	1 per Cooler	Temperature of samples between 2 and 6 degrees C	Flag results in the Accuracy Statement

Reports: The analytical laboratory will provide reports of the analytical results in addition to a copy of the pertinent QC data; and GZA will prepare project technical report documenting the findings of the assessment work. The laboratory reports will include pertinent field data, a laboratory narrative, and information regarding field or laboratory modifications. Copies of the original laboratory analytical results reports and the QC data will be appended to the project technical report.

Data Validation and Data Usability: Project personnel will review data in accordance with the MassDEP policy titled “MCP Representativeness Evaluations and Data Usability Assessments” (Policy #WSC-07-350) dated September 19, 2007.

J:\19,000-20,999\19274\19274-03.TLB\TSCA Report\Appendices\TSCA Appendix C.docx

© 2012 - GZA GeoEnvironmental, Inc. GZA-19,000-20,098\19274\19274-03.1LB\Figures\19274-08\_Base\_Plan-v3.dwg [FigC1 Confirmatory-Sampling-Plan] March 29, 2012 - 3:57pm elaine.donohue



LEGEND

- PROPOSED BOTTOM CONFIRMATORY SAMPLE
- PROPOSED SIDE CONFIRMATORY SAMPLE
- PROPERTY LINE
- INDICATES TOWN BOUNDARY
- LIMITS OF BORDERING VEGETATED WETLAND AS FLAGGED BY BSC GROUP MARCH 2007

SOURCE:

- THIS PLAN WAS PREPARED FROM AN ACTUAL ON-THE-GROUND SURVEY PERFORMED BY BSC GROUP, INC. BETWEEN FEBRUARY 25, 2008 AND MARCH 21, 2008.
- THE PROPERTY LINES SHOWN ARE TAKEN FROM PLANS, DEEDS AND CERTIFICATES OF RECORD AND ARE BASED ON THE ABOVE MENTIONED FIELD SURVEY.
- THE WETLAND RESOURCE AREAS SHOWN WERE DELINEATED BY BSC GROUP, INC. DURING THE ABOVE MENTIONED FIELD SURVEY.
- ELEVATIONS SHOWN ARE BASED ON GPS OBSERVATIONS MADE DURING THE FOREMENTIONED SURVEY AND ARE ON NAVD (NORTH AMERICA VERTICAL DATUM) 1988.
- THE SURVEYED SITES SHOWN HEREON ARE LOCATED IN FLOOD HAZARD ZONE X, AREAS OF MINIMAL FLOODING, AS SHOWN ON FLOOD INSURANCE RATE MAP 250318 0002C IN MILLBURY AND MAP 250306 0001D IN GRAFTON.
- ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE ONLY. SEE CHAPTER 37 ACTS OF 1963, MASSACHUSETTS GENERAL LAWS. WE ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN. BEFORE PLANNING FUTURE CONNECTIONS, THE APPROPRIATE PUBLIC UTILITY ENGINEERING DEPARTMENT MUST BE CONSULTED.

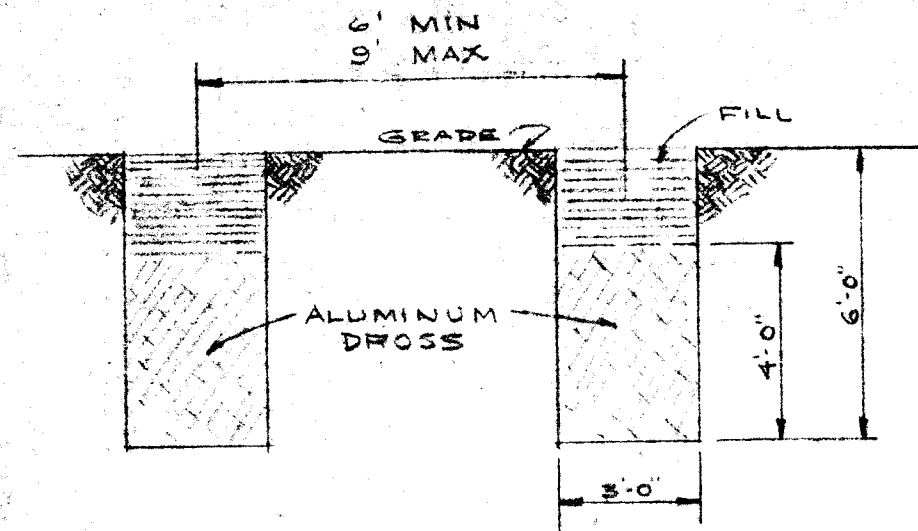
NO.		ISSUE/DESCRIPTION	BY	DATE
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.				
WYMAN GORDON WESTSIDE NORTH GRAFTON, MASSACHUSETTS				
CONFIRMATORY SAMPLING PLAN PROPOSED REMEDIATION WEST PCB AREA				
PREPARED BY:		PREPARED FOR:		
GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		WYMAN GORDON A PCC COMPANY		
PROJ MGR: TLB	REVIEWED BY: GWM	CHECKED BY: TLB	FIGURE	
DESIGNED BY: DCB	DRAWN BY: DCB/END	SCALE: 1" = 20 FEET	C1	
DATE: 03-29-2012	PROJECT NO. 01.0019274.08	REVISION NO.		



## **APPENDIX D**

W-G HISTORICAL PLAN DRAWING NO. C-4514

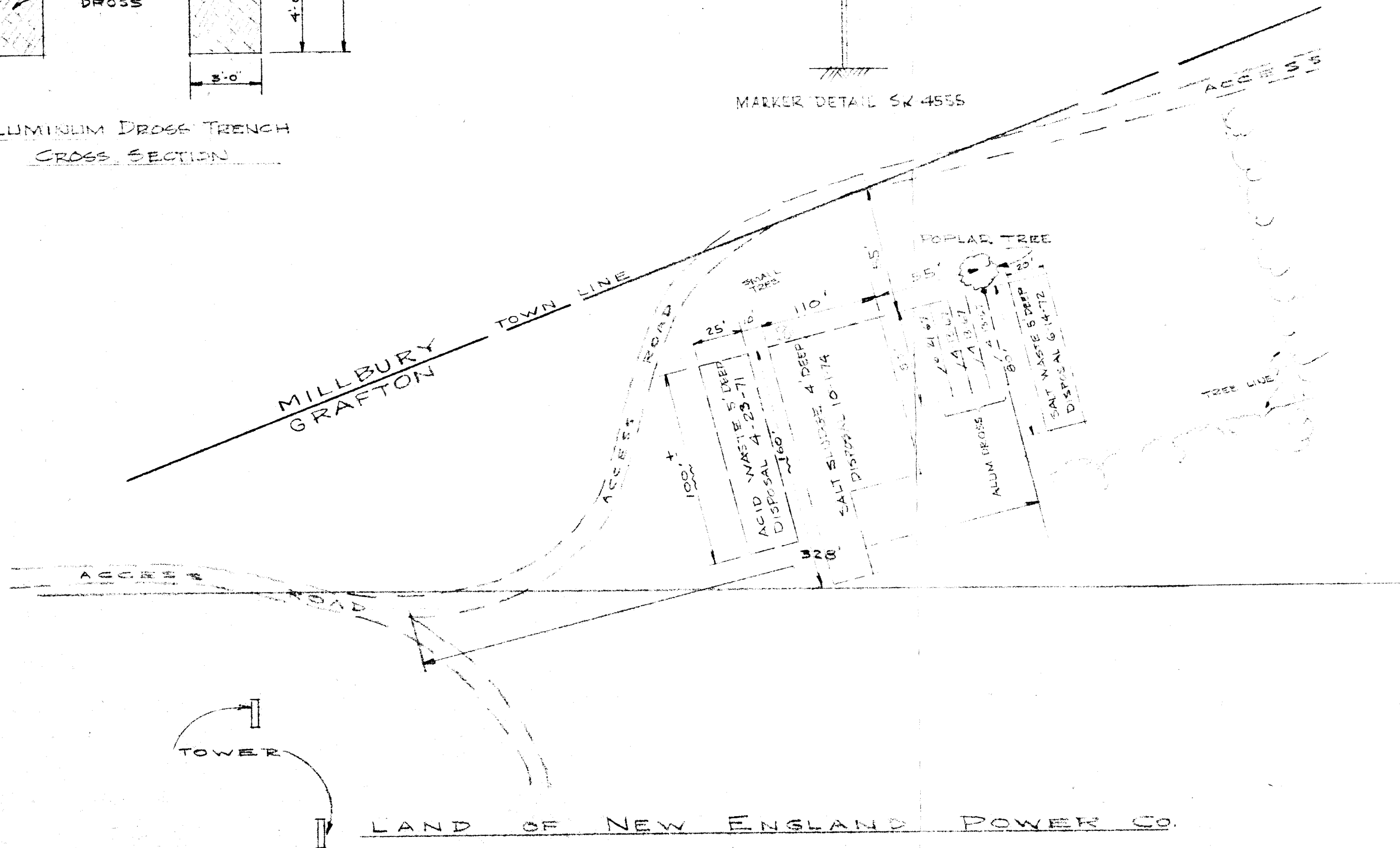
SUPERSEDING		SUPERSEDED BY		
LET.	DESCRIPTION OF CHANGE	DATE	BY	APP.
A	ADDED ACID WASTE DISPOSAL TRENCH	4-23-71	NEA	
B	ADDED SALT WASTE DISPOSAL TRENCH	6-14-72	NEA	WGC



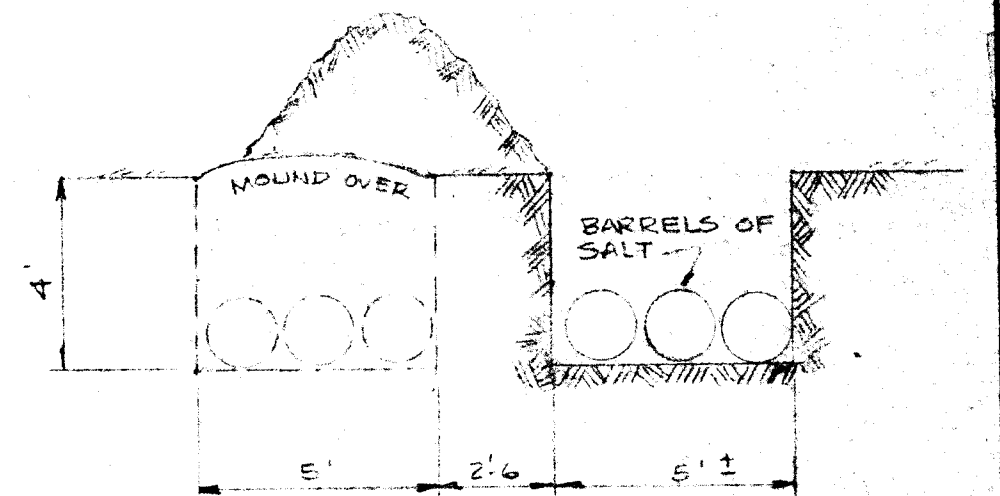
ALUMINUM DROSS TRENCH  
CROSS SECTION

NOTE  
2 MARKERS REQUIRED -  
FOR EACH END OF  
ACTIVE TRENCH -  
MOVE TO NEW TRENCH  
WHEN FILLED

MARKER DETAIL SK 4555



C-4514



SALT WASTE TRENCH  
CROSS SECTION

CONFIDENTIAL

REFER TO DWG SK 5549 FOR WASTE DISPOSAL SITE.

DISPOSAL OF MATERIAL IN ACCORDANCE WITH  
MASS DEPT. PUBLIC HEALTH REQUIREMENTS.  
RE: GRAFTON - CAUSTIC SALT SLUDGE DISPOSAL, DTD. 2-14-72  
R.A. RONDEALI, REGIONAL ENGINEER

TRENCH: TO BURY ALUMINUM DROSS		JOB FILE NO. 033-74
ALUMINUM MELT LANDFILL		MICROFILM.
THIS DRAWING AND INFORMATION THEREON IS THE PROPERTY OF <b>WYMAN-GORDON Co.</b> GRAFTON PLANT WORCESTER, MASS.		SHEET 1 OF 1
DRAWN BY R.H.H.	CHECKED BY NEA	DRWG. NO. C-4514
TRACED BY	CHECKING DATE 1-13-67	
SCALE AS NOTED	APPROVED BY	
DATE 4-8-67	APPROVAL DATE	



## **APPENDIX E**

CERTIFICATION IN ACCORDANCE WITH 40 CFR 761.61(a)(3)(E)



CERTIFICATION IN ACCORDANCE WITH 40 CFR 761.61(a)(E)(i)

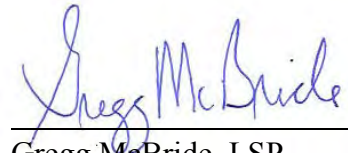
All sampling plans, sample collection procedures, sample preparation procedures, extraction procedures, and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the cleanup site that is the subject of this document are on file at the following location:

GZA GeoEnvironmental, Inc.  
One Edgewater Drive  
Norwood, Massachusetts 02062

Contact: Gregg W. McBride, LSP  
Phone: (781) 278-3828

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Brian Postale  
Manager of Safety and Workers Compensation  
Wyman-Gordon



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Gregg McBride, LSP  
Principal  
GZA GeoEnvironmental, Inc.